PUBLISHED MONTHLY
FOUNDED IN 1905

EXCAVATING ENGINEER

DEVOTED EXCLUSIVELY TO EXCAVATION

About Excavating Projects — By Excavating Men — For Excavating Men — The World Over

Vol. 28 AUGUST, 1934 No. 8

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Looking Ahead

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Published Monthly by **THE EXCAVATING ENGINEER PUBLISHING COMPANY, South Milwaukee, Wisconsin, U.S.A.**

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Regular subscription: $1.00 a year; Canada and foreign, $2.00 per year. Special subscription: Upon application on card inserted in this number, this publication will be sent frequently (not regularly) free of charge, to companies, executives and supervisors engaged actively in the industry of excavation.

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FOR SUBMARINE EXCAVATION

Illustrated: 30-inch hydraulic suction dredge New Jersey, 5000 horse power, Diesel-electric. Below: 3-yard clamshell dredge and 18-foot gold placer dredge.

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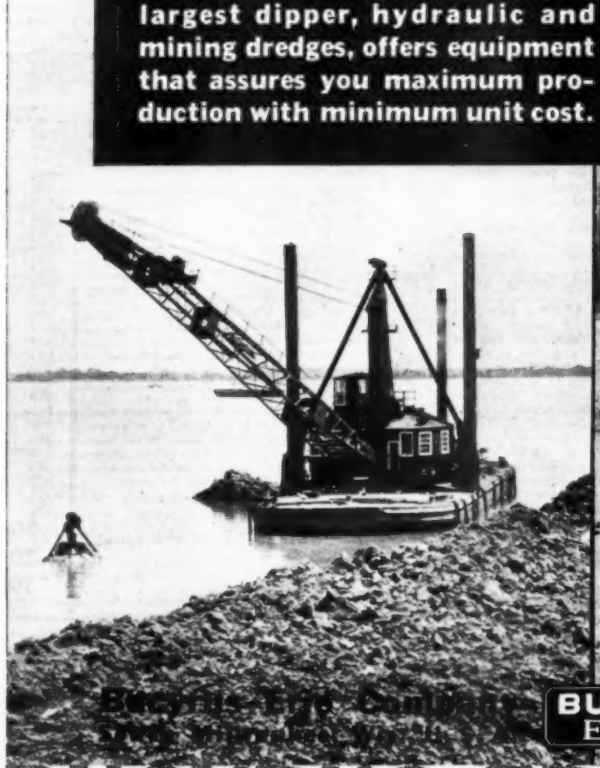

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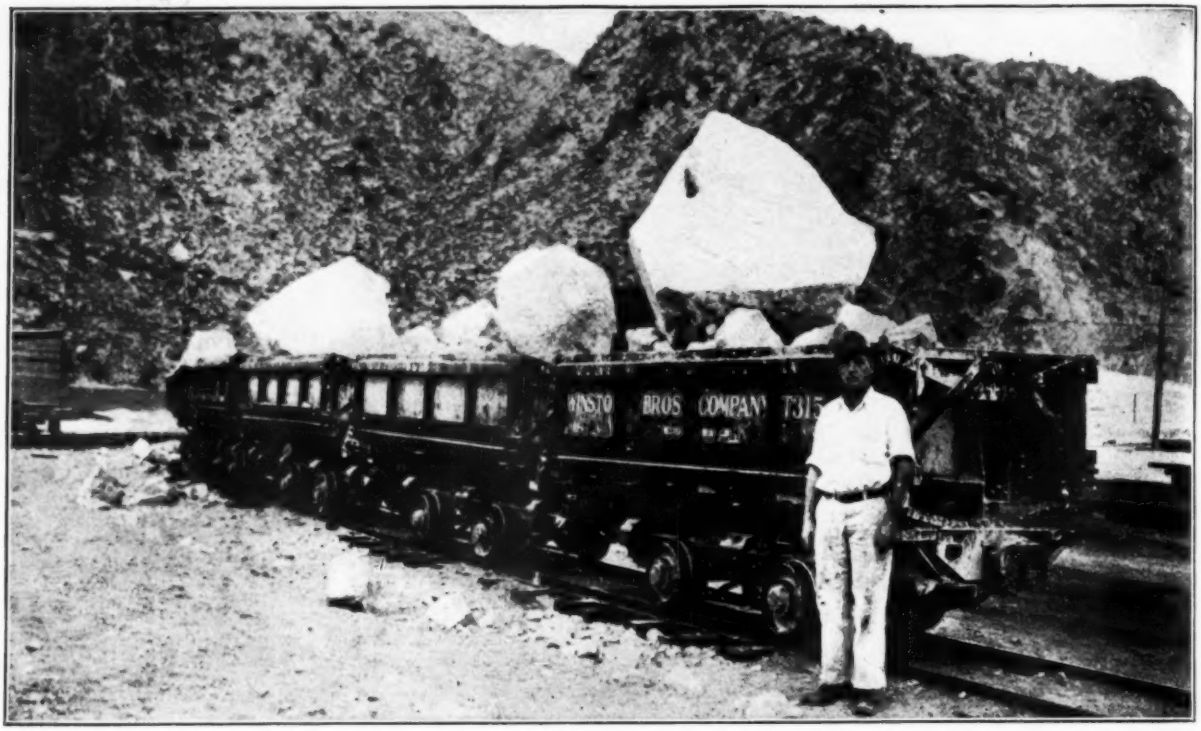

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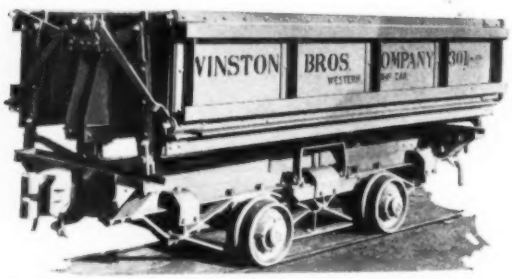

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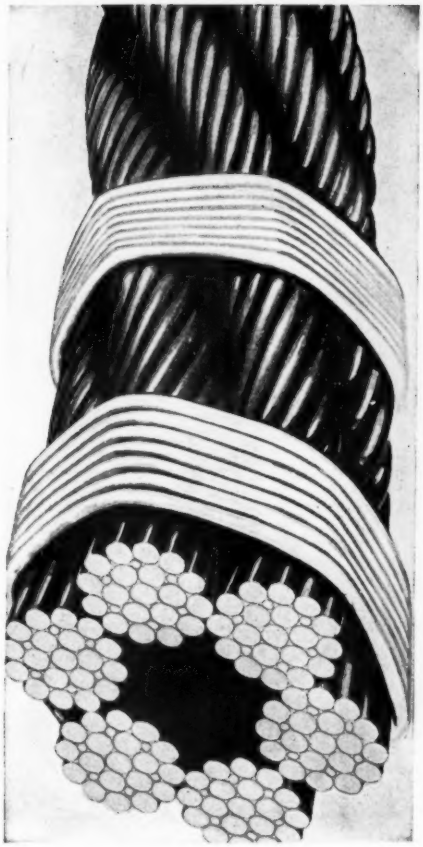

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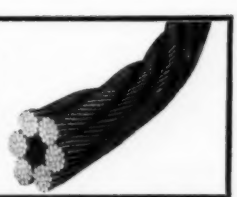

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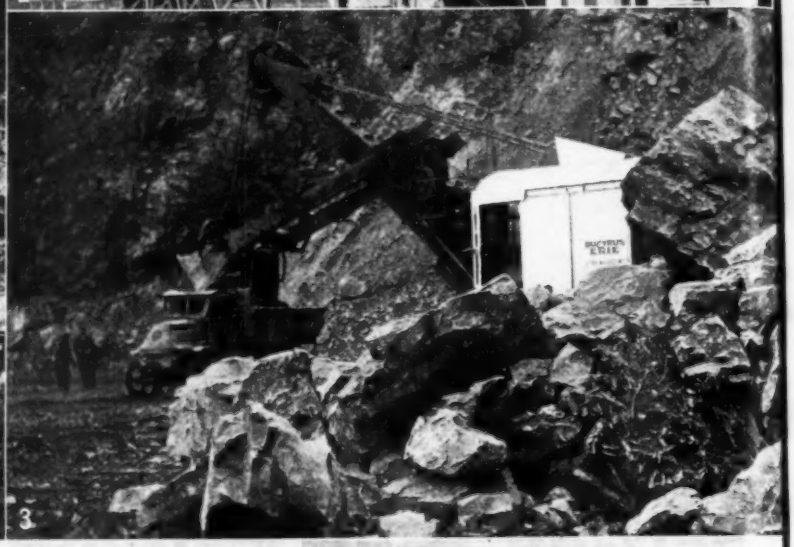
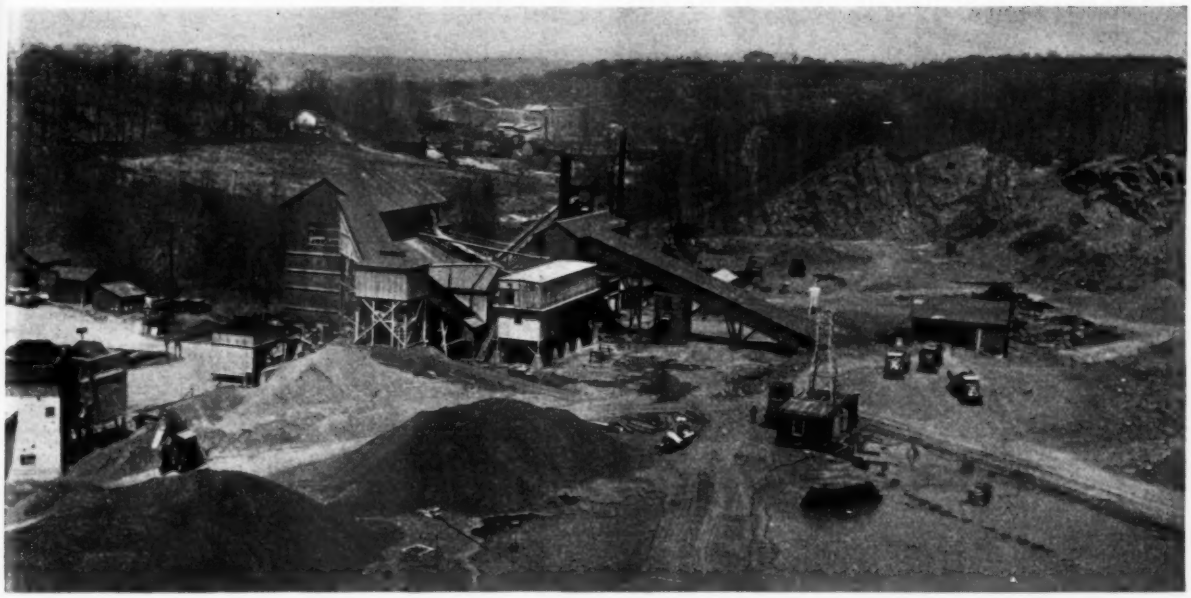
CRUSHED TRAP ROCK
MONTCLAIR HEIGHTS



EXCAVATING ENGINEER
FOUNDED 1905

AUGUST 1934
VOL. XXVIII NO. 8



General view of Consolidated Stone & Sand Company's plant. Primary crusher at right and abandoned quarry behind it.

Dust Control in Traprock Production

Consolidated Stone & Sand Company adds dust-arrester system to modern quarry layout to prevent silicosis, and profits by the addition.

By **D. W. EVANS**

THE ROCK QUARRIED by Consolidated Stone & Sand Company at Montclair Heights, New Jersey, comes from the southern end of the same ridge which forms the Palisades, those scenic cliffs along the West bank of the Hudson River. At the quarry they call it traprock, while geologists tell us it is practically the same as basalt — dark grayish igneous rocks. The Palisades, of course, are a fine example of columnar structure. At this quarry the columnar structure is fine, too — fine for shooting. The rock lies in vertical strata which makes such ideal conditions that blasting costs are far below those usually expected in such hard, tough rock.

Favored by this freak of nature, this company has spared no effort in equipping a thoroughly modern plant to produce quality crushed stone. Operations started here before the present century began, in a quarry north of the present one. Ten years ago this quarry was merged with two other plants located in Upper Montclair and Great Notch, under the present name.

1. The Bucyrus-Erie 75-B noses into the rock pile. Operator Patsy De Lorenzo can't find a thing wrong with this shovel except that it digs too much. 2. The shipping end of the Consolidated rock plant and—at left—the Amicsite plant. 3. The 75-B drops 8000 odd pounds of hard traprock into a Mack truck. 4. One of the two Haiss loaders fills a waiting truck. 5. Office and headquarters of Consolidated Stone & Sand Company are centered in this attractive house. 6. This Northwest clamshell is kept busy on the stock pile.

General view of quarry showing Bucyrus-Erie 75-B loading one of the Mack trucks. In the background is the Bucyrus-Erie 50-B shovel, now held in reserve. One of the two blast hole drills can be seen on top of the quarry face.

Before starting on a tour of the quarry and the plant we stop at the Company office, located in an attractive frame house far more picturesque than the usual office. A fine mounted collection of Indian arrowheads, we learn, were all found in the vicinity. None of them actually came from the quarry though many peculiar rock formations are picked up there.

Stripping Done by Contract

From this office a road leads along past the quarry floor where two electric shovels are busy loading trucks. After a steep ascent the top of the face is reached. This has been stripped back from the edge leaving the rock bare for 100 to 200 feet. There is no sign of any stripping equipment. It appears that stripping is done by contract every four or five years, an arrangement which has proved to be most economical here. Overburden runs 5 to 6 feet in depth on the average, with occasional pockets 10 to 15 feet deep. A few weeks' work by a contractor cleans up enough rock for several seasons, then the stripping expense and problems are out of the way until the next contract is necessary.

Two blast hole drills, electrically driven, are churning away 110 feet above the quarry floor. On an average, holes are set down 28 feet from the toe, and 27 to 28 feet apart. Due to the character of the rock, frequent vertical seams occur, and full advantage is taken of these in laying out holes for the drills. Progress of the drills through the rock varies considerably, as the top 90 feet is very well fractured. Because of the seams, drills jam every now and then, but usually holes go down in a hurry. The bottom 20 feet or so is solid blue traprock with no seams at all, and here they seldom get more than 1½ to 2 feet per hour. The drills are 6⅝ inches in diameter at the top, tapering to 6 inches when the bottom of the hole is reached 5 feet below the quarry floor.

One of the X-71 Ingersoll-Rand drifter drills putting a toe hole into the bottom of the face.

Toe Holes Drilled for Better Blasting

Down on the quarry floor, two Ingersoll-Rand X-71 drifter drills are at work, putting in toe holes beneath the blast hole drills. This is necessary because the bottom 20 feet of solid rock must be broken up.

In loading the vertical holes, 5x16-inch cartridges of Hercules Powder Company's 60% quarry gelatin are used. The holes are

not sprung and loading is usually straight column loading at the bottom where the rock is solid, with light deck loading above.

Contrary to the practice in many quarries, the blasts are frequent and relatively small, 4 to 5 holes being loaded and shot at a time, bringing down 30,000 tons of rock. This is so well broken up for the quarry shovels that a single jackhammer man can drill and shoot all the oversize rock.

Shovel Capacity Increased

Up until four years ago, loading of rock was handled by a 2-yard Bucyrus-Erie 50-B electric shovel. In April 1930, due to increased plant capacity, a 2½-yard Bucyrus-Erie 75-B electric quarry shovel was installed. Under normal conditions this 75-B loads all the stone for the plant, the 50-B going to work in addition during the peak of the construction season. The shovels load into Mack trucks equipped with special bodies built in the quarry's repair shop.

The quarry floor, over 1000 feet in length and 200 to 500 feet in width, has been filled in recently with fine rock from the plant to give the trucks a downhill haul to the crusher. One of the trucks reserved for stock piling brings in a load every now and then when it can be spared. The result is a fine surface over which the fleet of five quarry trucks travel at full speed to and from the shovels.

Left. The peculiar vertical strata of the rock is shown here. This structure makes good shooting easy. Right. The jackhammer crew of one perched on a big rock. Nature has made it very easy to get good shooting results at this quarry.

75-B Loads 350 Tons an Hour

Patsy De Lorenzo, who operates the Bucyrus-Erie 75-B, sticks the big dipper into the rock pile and swings around to dump it into the waiting truck. Intent upon his job, he has little time to comment on the shovel. Says he has no trouble with it, no breakdowns, no repairs of any consequence in four years, shovel satisfactory and the best one to run he ever had his hands on. Only thing about it that he thought deserved comment was that it put out a lot more rock than he thought it would when first set up and put into service.

Superintendent Pohlkotte, questioned about output, explains that plant capacity was rated at 2500 tons an eight-hour day. Once, when the shovel had a good pile of rock ahead of it and the plant was running wide open they put out 60 six-ton trucks an hour — better than 350 tons. Normal production, of course, is somewhat below this figure, but day in and day out the husky 75-B with Patsy De Lorenzo at the levers will load up the trucks as fast as they can pull in. Each load runs from 6 to 7½ tons of traprock.

The haul to the primary crusher will average 500 feet. Because of this short haul a few trucks

During the rush season both the 75-B and 50-B shovels are used to keep up with the demand for crushed stone.

Looking from beneath the Dust-Arrester bins at a truck dumping its load into the maw of the primary crusher.

can handle the output of the quarry shovel. The crusher house is located at one end of the present quarry face, just south of the old quarry which is now abandoned, and used for storage of railroad ballast. The crusher is a rugged 60"x42" Farrell, firmly set in concrete and backed up by new steel girders to take the thrust. These replaced a bulky set of timbers in the overhauling of the entire plant, which was completed last fall.

From the primary, which is set to a 6½" opening, a 36" conveyor belt carries the rock up a 22° incline to the main part of the plant. The secondary crushers include two 16" Allis-Chalmers gyrators, two 4-ft. Symons cones and a Traylor gyratory. Rock reaches these after rumbling through a revolving Bacon scalping screen, and then rises over a second 36" conveyor to the sizing screens, including:

2—Robbins 4'x10' single deck Gyrex screens.
4—Robbins Gyrex 4'x8½' double deck.
3—Link Belt 4'x8' double deck vibrating screens.
3—Link Belt 3'x5' double deck vibrating screens.

Located on substantially level ground, the plant requires conveyors between the various screen layouts. All conveyors are driven by Link-Belt speed reducers with individual motors.

In line with other features of the modern plant, this one is equipped to produce stone in any of the required commercial sizes, and the layout further provides for recrushing sizes not in demand.

Patsy De Lorenzo, with a good lunch inside him, starts on on a run of 60 six-ton trucks in an hour.

Turning Dust Into Revenue

Anyone who has lived near crushed rock plants knows the thick dust they kick up, especially when a hard rock is handled. The Consolidated Stone & Sand Company, due to their modernizing, affords a welcome relief from this condition. Every conveyor, every screen, is completely enclosed in a housing of matched lumber, each housing with a conduit leading to a powerful suction fan with a capacity of 40,000 feet of air per minute. This fan is the heart of the Sly Dust Arrester system which not only eliminates undesirable working conditions but pays dividends as well. This system was installed last October on the very justifiable grounds that it prevents dust from getting into bearings, and also prevents that dread disease too prominent in rock plants of late — silicosis.

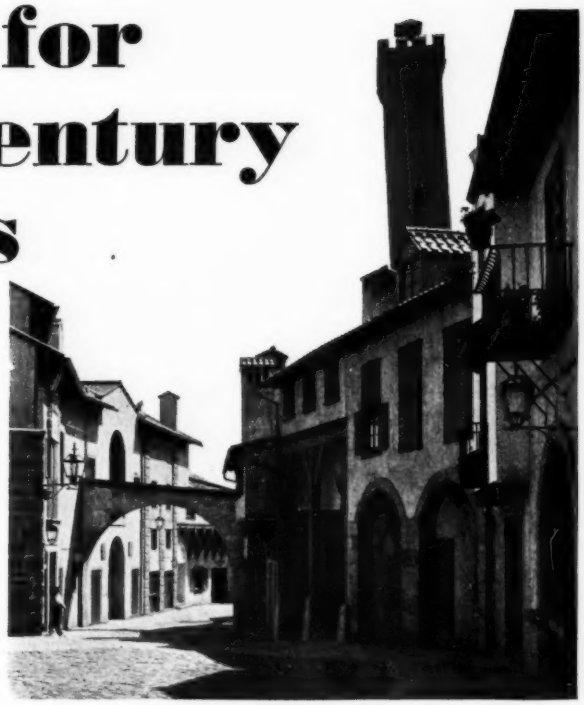
The suction fan draws dust from all parts of the enclosed screen and conveyor system to a central series of folds of heavy cloth which catch the dust and deposit it in bins for convenient removal. Here two men load the

(*Continued on Page 368*)

A pair of vibrating screens completely enclosed and dustless—no fear of silicosis with a layout like this.

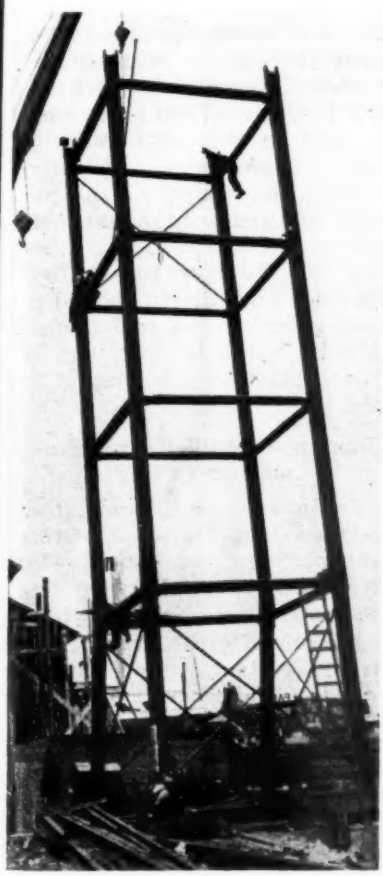
Pile Driving for the 1934 Century of Progress

Mackie - Thompson - Tamm, Inc., marine contractors, make quick work on rush pile driving jobs.



KAUFMANN-FABRY PHOTO

The beauty and charm of the old world is reproduced here in the Italian Village with its leaning tower.



The foundation is the principal problem in a structure of this type—built 130 feet high and five feet out of plumb. This picture shows the framework going up on the clustered piling driven by Mackie-Thompson-Tamm.

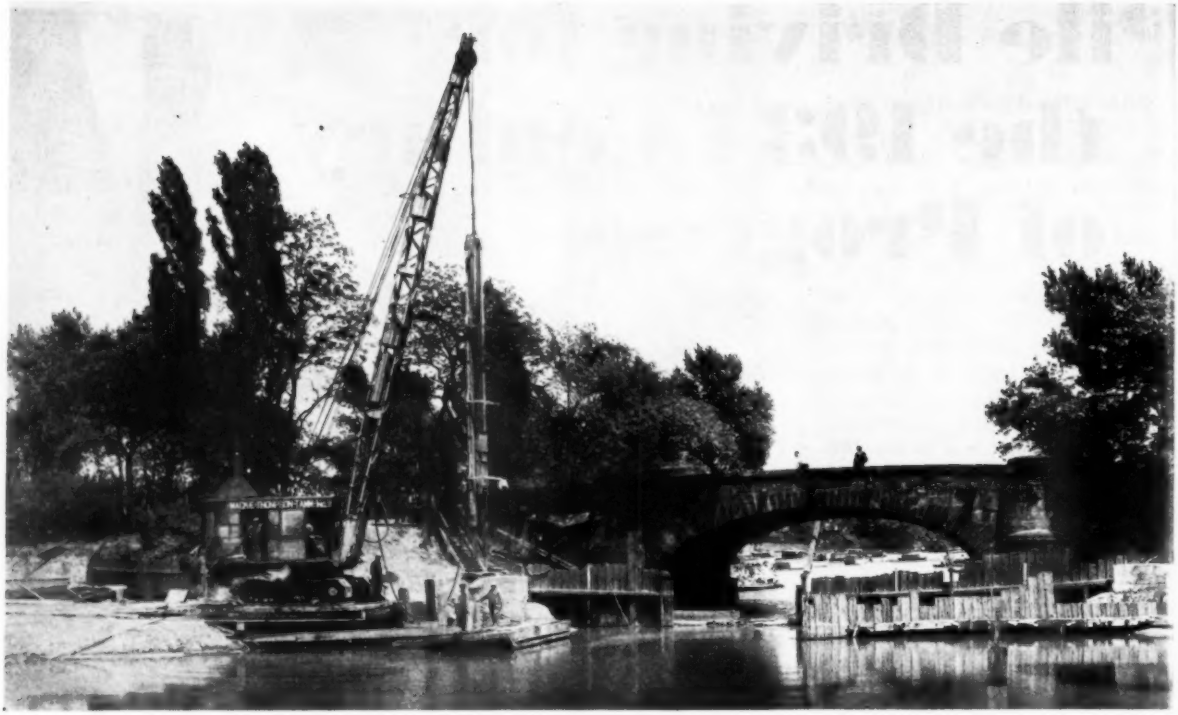
VISITORS to the 1934 Century of Progress at Chicago are deeply impressed by the beauty and modernistic design of the many buildings to be seen there. Beside the new and futuristic buildings there are to be seen replicas of old-world villages. Perhaps one of the most interesting buildings on display, not only because of its beauty and historical background but also because of its design and construction, is the replica of the Leaning Asinelli Tower of Bologna, located in the Italian Village.

The problems of design and erection of a leaning tower, 130 feet high and 5 feet out of plumb, called for unusual treatment on the part of the architect.

A view of the completed tower shows that these problems were successfully solved. Schmidt, Garden and Erickson, Chicago architects, who designed the Italian village, applied the principles of cantilever-bridge construction in designing the tower.

Steel Framework Anchored to 55-foot Piles

At each corner of the tower five wooden piles were driven 55 feet into the earth. Concrete caps were poured, tying the piles together into anchors capable of resisting the pull developed by the leaning tower, including additional stresses caused by high wind velocities. While the tower is a replica of the original in appearance, in construction it is radically different. Ancient castles and towers were apparently constructed by the craftsmen piling stone upon stone until the job was completed. Foundations were unnecessary because of the tremendous weight of the practically solid stone walls. In the replica at the Italian village the stonelike walls are made of cast plaster "stones" laid over a steel framework. Consequently the total weight of the tower is very little compared to the stresses due to its being out of line. For that reason the steel framework is designed using cantilever prac-



Because of the low bridge, floating equipment could not be brought into the Jackson Park lagoon. This created no complications as Mackie-Thompson-Tamm had their Bucyrus-Erie 42-B pile driver available to remove the cofferdam.

tices and securely anchored at each corner.

Speed Necessary on This Project

The general contractor who erected the leaning tower was A. L. Jackson Company, of Chicago.

The pile driving was done by Mackie-Thompson-Tamm, Inc., of Chicago, general marine contractors.

The 55-foot piles were driven by a Bucyrus-Erie 42-B steam pile driver, oil fired, equipped with a 60-foot boom and 75-foot leads, and a No. 1 Vulcan hammer.

KAUFMANN-FABRY PHOTO

A solid foundation is necessary to a structure of this kind because of the high stresses set up by the speeding cars. This Cyclone Coaster rests on seventy piles 65 feet long driven into the lake bottom.

Due to the short time allowed for erection of the various buildings at the 1934 Century of Progress, speed was the key word. Mackie - Thompson - Tamm were able to drive all of the 55-foot piles in less than five hours. This completed their contract at the Italian Village.

The pile-driving leads were lowered and the 42-B was moved one mile under its own power to the Chrysler Building where another pile-driving contract was filled. Here they drove twenty-eight piles, 55 feet long, in six hours. Upon completion of this job the 42-B was again moved under its own power to the Cyclone Coaster site and seventy piles 65 feet long were driven in twenty-four hours.

Here the pile driver worked in water from one to four feet deep. In addition the lake bottom was very soft muck for a depth of about 15 feet. It required considerable ingenuity to keep the 42-B pile driver from sinking out of sight in this mud. Mats of timbers were used which distributed the weight of the pile driver and reduced the maximum load on the lake bottom to less than 200 lbs. per square foot. The piles when driven showed no bearing for 55 feet and fetched up only in the last ten feet of driving but with a bearing of 20 tons.

Bucyrus-Erie Pile Driver Economical to Use

Mackie-Thompson Tamm, Inc., operate considerable floating equipment in connection with their marine work, but they find the caterpillar-mounted, steam pile driver of great value. A. B. Stroh, Secretary of the Company, tells us "While our Company is equipped with a full line of floating equipment, it has been found that our Bucyrus-Erie 42-B caterpillar mounted machine has been far more suitable and practical to operate on pile driving

wherever possible, since we have discovered that the 42-B is much faster and far more economical than floating equipment on many projects."

Surmounting Difficulties

The ease in which the 42-B pile driver is moved from one job to another and the manner in which it allows itself to be maneuvered in almost inaccessible locations was illustrated with the 42-B pile driver on a recent marine job where Mackie-Thompson-Tamm, Inc., removed a cofferdam and erected a dock in the Jackson Park lagoon for the South Park Commissioners. In the picture on page 366 note the low clearance of the fixed bridge in the background which made it impossible to bring in marine equipment and afforded the 42-B pile driver an opportunity to prove its advantages where difficulties were imposed. The efficiency of their organization and the dependability of the 42-B pile driver together with other modern floating pile drivers and derricks which they have, has earned for Mackie-Thompson-Tamm, Inc., an enviable reputation for building docks and foundations of the best quality and workmanship in record time.

Awarded Contract for Driving Piles for the New Chicago Barge Terminal

Mackie-Thompson-Tamm, Inc., are now working on a pile-driving project for the new $200,000 Chicago Barge Terminal located near the junction of the Chicago River and the Sanitary Ship Canal near South Damen Avenue. This, while it will be owned by the Illinois Waterway Commission, is to be paid for by the Illinois Central and Santa Fe Railroads. When completed it is estimated the Terminal will have a capacity of one-million tons of freight annually.

Left:
The Bucyrus-Erie 42-B pile driver is seen in action driving oak piles at the site of the new $200,000 Chicago Barge Terminal.

Right:
This new dock erected in Jackson Park lagoon by Mackie-Thompson-Tamm will serve the many owners of power and sail boats who use the harbor.

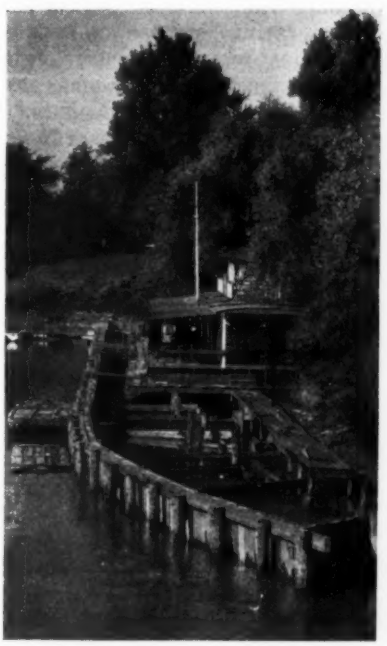
KAUFMANN-FABRY PHOTO
Here at the Chrysler Motors Building, Mackie-Thompson-Tamm, Inc., drove 28 piles, 55 feet long, in six hours.

Here is a neat job of pile driving on a breakwater and retaining wall built by Mackie-Thompson-Tamm, Inc., for the City of Evanston, Illinois.

Mackie-Thompson-Tamm's contract at the Barge Terminal calls for the driving of oak foundation piles with steel shoe points to bed rock. Also they will have to drive 600 lineal feet of arch-web steel sheet-piling 33 feet to bed rock, all of which must be completed within 45 working days. Operations are being carried on with two six-hour shifts per day.

Personnel in Charge of Project

C. M. Briggs is Terminal Engineer and T. B. Casey is Construction Engineer for the Illinois Waterway Commission. Dan Cameron is General Superintendent for Mackie-Thompson-Tamm, Inc.



Dust Control in Traprock Production

(Continued from Page 364)

The unusual stratification of the traprock at this quarry results in good breakage such as is seen here.

dust into 100 pound bags which find ready market for filler in asphalt shingles, some varieties of paint, and many other industrial uses.

Road Building a Principal Market

The rock in its final sizes, after passing over the last of the series of vibrating screens, descends into bins which discharge into waiting trucks and gondola cars. The loaded cars are dropped down the railroad siding by gravity. The trucks depart for a variety of construction jobs in the neighborhood. Half the output of the plant, at present, is shipped direct to jobs of state highway construction. Another sizeable percentage also goes into streets in nearby cities and towns. About 10% of the output finds its way into building construction and the same proportion is shipped as railroad ballast.

Due to the fluctuating demand for the various commercial sizes, Mr. Pohlkotte explains that some of the output of the plant is trucked a couple of hundred yards to the stock piles. Here a Northwest clamshell crane and two Haiss elevating loaders are kept busy loading trucks. Immediate shipment, so important these days on construction jobs, is thus taken care of either direct from the plant or from the stockpiles.

North of the plant proper the various shops are located, and beyond these an Amiesite plant which takes care of a sizeable part of the plant output. The plant repair shop is completely equipped for all general maintenance operations.

At one side of this shop is the power room, full of transformers. All power is purchased, and converted here to the various voltages used in the plant. At the other side of the repair shop is the compressor room, housing two synchronous - motor - driven 750-cu. ft. Ingersoll-Rand compressors, one 2200-volt and the other 440. Both have just received a new coat of paint—an indication of the care all equipment at this plant receives. If you let things go, Mr. Pohlkotte points out, rust sets in. A couple of gallons of paint and a man's time are invested to good advantage in keeping things looking good.

Last, we step into the smith shop, mostly devoted to drill sharpening. Two Ingersoll-Rand sharpeners, one for blast hole drill bits and one for jackhammer drills, plus an Ingersoll-Rand oil burning forge are the principal pieces of equipment.

Stepping out of this shop, we note another house set at one side of the quarry floor. One half is devoted to the Superintendent's office, the other to a transformer for the quarry shovels. Originally 2200-volt current was planned to be carried direct to the shovels. This transformer steps down the voltage to 440, and the relatively short wires to the shovels do not cut down the voltage, which might impair shovel operation. A safety measure, we learn. Safer for the men in case a wire gets frayed. So is the dustless plant safer for the men. We realize the whole layout from the blast hole drills to the scale-house has been made with safety in mind. Economy, to be sure—but safety first. With this thought, and with thanks to these men whose time was given to furnish data for this article, we leave the Consolidated Stone & Sand Company, with a wish for continued success.

A couple of oversize boulders can't slow up this shovel.

Old Times & Old Timers

Building the "P. Mickey & Y." Siding

OLD TIMER William Durant sent us these two pictures of machines which worked in Scully Yard in 1902 and 1903 building 36 miles of siding for the "P. Mickey & Y.," which was the nickname for the Pittsburgh, Yohogany, Chartiers R. R. Altogether there were 7 machines on this job, and they worked 18 months to build the 36 miles of siding.

The style A Marion on the right was photographed at McKees Rocks, Pennsylvania, in 1902. George Brady was the runner; William Durant, craneman; John Farmer, fireman, and Joe Lienet, foreman.

The Model G Marion shown below was used by the T. A. Gillespie & Company of Pittsburgh on this job. Walter Briggs was the runner, George Brady the craneman, T. V. McCarty the pipe-fitter, Mr. Heckel the superintendent, and John Duffy the master mechanic.

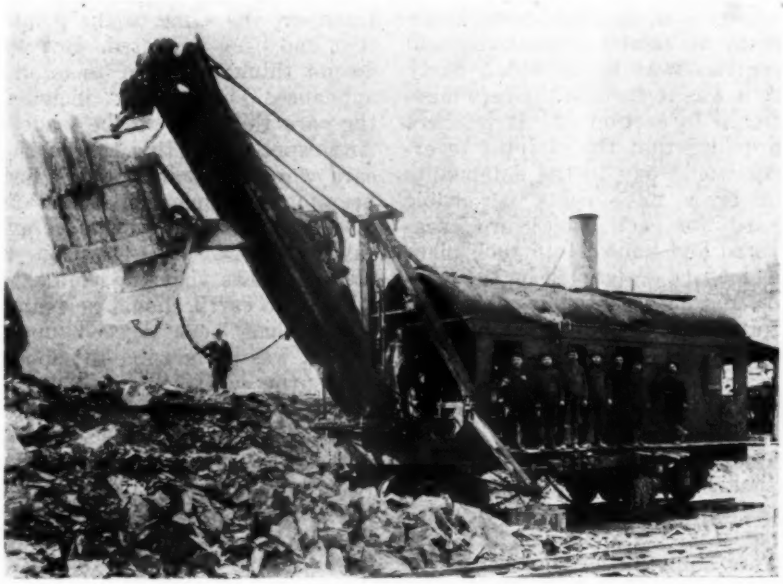
Old Timer Durant tells an amusing story about their troubles getting dirt for a Bucyrus friction shovel.

"A man by the name of McAndrews was runner and Ed Morreny was craneman. It was a friction machine and if Eddie didn't get his sticks out, McAndrews had to drop him back into the pit. And they would both light their pipes when they started for the car with a bucket of dirt.

"We were always bothered to get dirt and rock down to keep the shovels going. One day a man by the name of Joe Lyanet came. He said he could furnish dirt if they gave him the powder. They told him he could have all he wanted. He put 60 men to drilling on a side hill. He called for 500 pounds of powder, and put that in the holes, and used a half car of dynamite.

"We had dirt — the track was full, and Charters Creek was full, and when Brady and I went down after the shot, Joe was fighting copperhead snakes with his cane. We had plenty dirt after that."

Thanks, Old Timer Durant.



Another Railroad Job in Pennsylvania

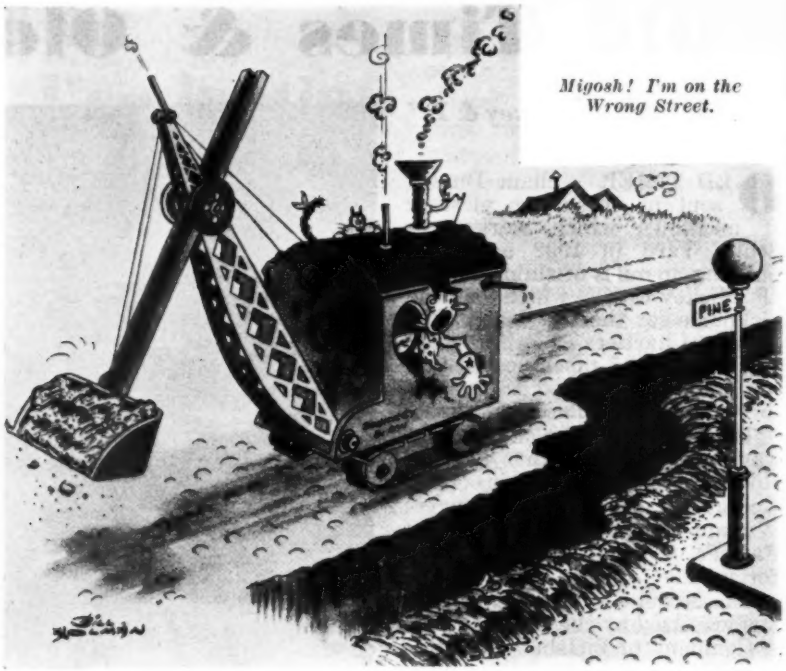
OLD TIMER Steve Pody has been reading our Old-Times-and-Old-Timers section and writes from New York about the men he worked with 31 years ago.

"About 1903 I was working for Sam Ferguson, half way between Little Washington and Burgettstown, Pa., on a railroad job. Sam Ferguson, like Mike Elmore, another old-time construction man, was always looking after the interest of his employees.

"I was taking apart and loading two Style A's on wagons which were then hauled over rough roads from Little Washington to the job. There Martin Kane and Tom McVeigh were setting them up. Bob Vanson was Superintendent. Tom Downing, Paddy O'Brien, Harry and Joe Dowing were also on that job, and a happy bunch they were.

"From there I went to work for Patterson and Moran on a Standard 45-ton Thew. Only two or three were built. They were a light built, up-to-date machine with the swinging lever on the right side. This job was near Carnegie and the machine had been standing on the right-of-way

(Continued on Page 373)



Migosh! I'm on the Wrong Street.

1000 NEW JOKES—DELL PUB. CO.

When the Contract is Not Clear

By **ARTHUR L. H. STREET,** *Attorney at Law*

UNDER a fundamental rule of law neither party to an excavating contract—or any other agreement—will be permitted to contradict its written terms by showing that the real agreement of the parties was different from that signed by them. The principal exception to this rule applies where the written contract, through fraud of the other party or through mutual mistake, fails to express the true agreement.

But parol (oral) evidence may be offered in court to show what the parties agreed upon in some particular as to which the written contract is either silent or self-contradictory.

These rules of law were applied by the Texas Supreme Court in a case involving a contract for excavation for a large warehouse. (195 S. W. 184.) About 20,000 cubic yards of earth was to be moved.

The court decided that the excavating contractor was entitled to show how the excavated material was to be disposed of, because the contract was either silent or self-contradictory on that point. The contractor was permitted to show that the earth was to be placed in a nearby gully and on cars.

It was further decided by the court:

"We are also of opinion that it was proper to allow parol testimony to establish what the real contract was as to which party to it was to furnish the cars mentioned in section 23. It is there provided that the plaintiff in error would pay to the defendants in error 22½ cents per cubic yard 'for each cubic yard excavated and hauled into such place as may be designated by the owner, and 22½ cents per cubic yard for each cubic yard excavated and loaded on cars.' From this it plainly appears that it had been agreed that one of the parties to the suit should furnish the cars upon which a portion of the dirt should be loaded. But the written contract fails to state which party it was to furnish the cars. This showed the contract to be incomplete also in this respect, and rendered admissible the evidence which was introduced to the effect that the plaintiff in error agreed to furnish the cars.

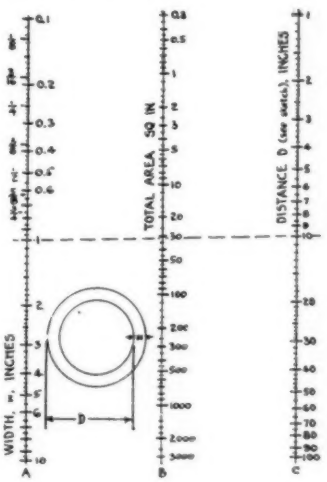
"The defendants in error had agreed in section 8 to furnish the tools, appliances, and labor necessary to excavate the earth and to transport the same to the points that had been indicated. But we do not think the term 'tools and appliances' necessarily included the cars that were to be loaded. And especially is this true if the cars were but points which had been agreed upon on which to place the dirt that was to be excavated. And since section 8 plainly shows that the points to which the earth should be transported had been agreed upon, then it was permissible to supplement the written contract by parol testimony to determine what points were to receive the dirt, and it is beyond our power to declare that the cars could not have been agreed upon between the parties as points of delivery."

FIELD NOTES

Find the Area of Ring

ONLY TWO dimensions are necessary to determine the area of any ring—the width of the ring, W, as shown in the sketch, and the distance D, also shown in the sketch. But notice carefully that the distance D is not the outside diameter, nor is it the inside diameter. It is the distance from the inside edge to the farthest outside edge. To use the chart simply run a straight line through the width W in column A, and the distance D in column C, and the intersection with column B instantly gives the area of the ring.

Thus, for example, the dotted line drawn across the chart shows that if the width W is one inch, and if the distance D is 10 inches, the area is a little over 30 inches. Estimating with the eye and reading the scale in the same way that you read a thermometer it is evident that the area is very close to 31 sq. in.



If the figures on the chart are not large enough to take care of your problem, simply add ciphers, in this way: For example, if the width W is 100 inches and the distance D is 1000 inches the same dotted line will solve the problem. Two ciphers are added in column A and two in column C, making a total of four ciphers. Therefore simply add four ciphers to the result in column B. The answer is 310,000 sq. in.

Similarly if the figures on the chart are too large, shift the decimal point over to the left in columns A and C. Then in the "answer" shift the decimal point to the left as many digits as shifted to the left in column A plus digits shifted in C. For example if W is .01" and D is 0.1" the area is 0.0031 sq. in.

W. F. Schaphorst, M.E.

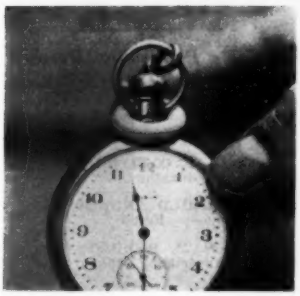
Electric Eye Safeguards Drinking Water

A NEW APPLICATION for the "electric eye" has been developed at the Scranton Mine at Hibbing, Minnesota. The underground section of the mine, which discharges 500 gallons of water per minute, has been closed off from the open-pit section. This mine-water is so pure and clear that it is pumped into the village water mains. Owing to blasting in the pit, dirt occasionally drops from the back of the drifts and makes the water cloudy. To keep this water from entering the village supply, an electric eye is installed in the discharge pipe. The eye actuates a relay which throws open a bypass when cloudy water is pumped, and lets it waste away. When the water clears, the relay closes the bypass and the water again enters the village mains.

Rubber Road Carpeting

THE SURVEYOR of London reports in a recent issue: "Since 1931, experiments have been carried on in Singapore with rubber road paving made direct from latex and poured in place. In 1932, a cementing medium was introduced which fastens the rubber to the foundation allowing a reduction in the rubber thickness of from two inches to one-half inch of moderate traffic. By this method, 871 square yards of rubber carpeting were laid on Paffles Street in December, 1932, and opened to traffic in 12 days. The quantity of latex used was 2,236 gallons having a rubber content of 20 percent. The cost was $3.90 (Straits Settlement dollars) per square yard. (One dollar, Straits currency equals about fifty-six cents.) The pavement stood the traffic well during the critical plastic stage and is improving perceptibly as time goes on."

Keeps Watch from Slipping Out of Pocket



WORK about the machine during the hot sultry breezeless days forces one down to only a scant minimum of body clothing. The watch is of course most conveniently carried in one of the breast pockets of the shirt. It often slips from the pocket when a quick stooping swing of the body is made, jumps out describing a circle on the chain, and ends up with a broken crystal or worse yet a badly dented case. Take one of the small tires or rings of rubber from a toy motor vehicle. Slip it over the winding stem and under the ring as shown. The soft rubber ring in contact with the cloth of the inside of the pocket keeps it at all times from slipping out. The watch and pocket can be almost upside down, but the watch will stay right in the pocket where it belongs. It is easy, however, to lift it out with the chain. Also keeps the fingers which may be somewhat grimy and grit covered from contact with the stem, and prevents the chain and ring from fouling.

—Frank W. Bentley, Jr.

What Explosives to Use for Various Types of Work

WITH INCREASED activity in public works and the NRA hour restrictions many men with limited experience are being called on to use explosives. To be of possible service to these new men, explosives experts of E. I. du Pont de Nemours have formulated a set of simplified general instructions covering selections of types of explosives for various blasting requirements.

For through cuts, the experts suggest quarry gelatin for wet outside work; higher strengths for hard rock, and lower ones for soft rocks. If the holes are not

(Continued on Page 374)

EXCAVATING ENGINEER

A Monthly Publication Devoted to Excavating and Allied Subjects

The Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

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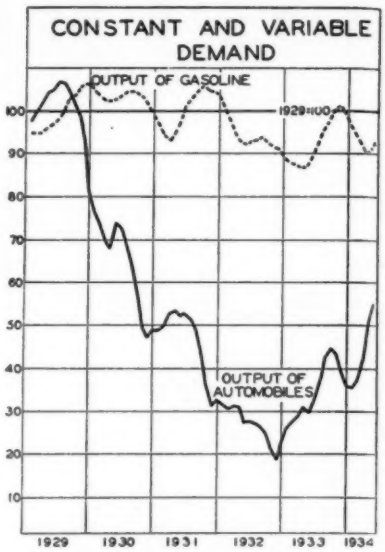
The Business Situation

TO MANY a producer of durable goods the present-day business charts are annoying. They show an unusually satisfactory increase in general business activity—an increase which is not at all in keeping with the increase that obtains in his own business. The major portion of the depression's unemployment problem was found in the durable goods industries and a large part of the unemployment in the service industries was caused directly by the unemployment found in the durable goods industries.

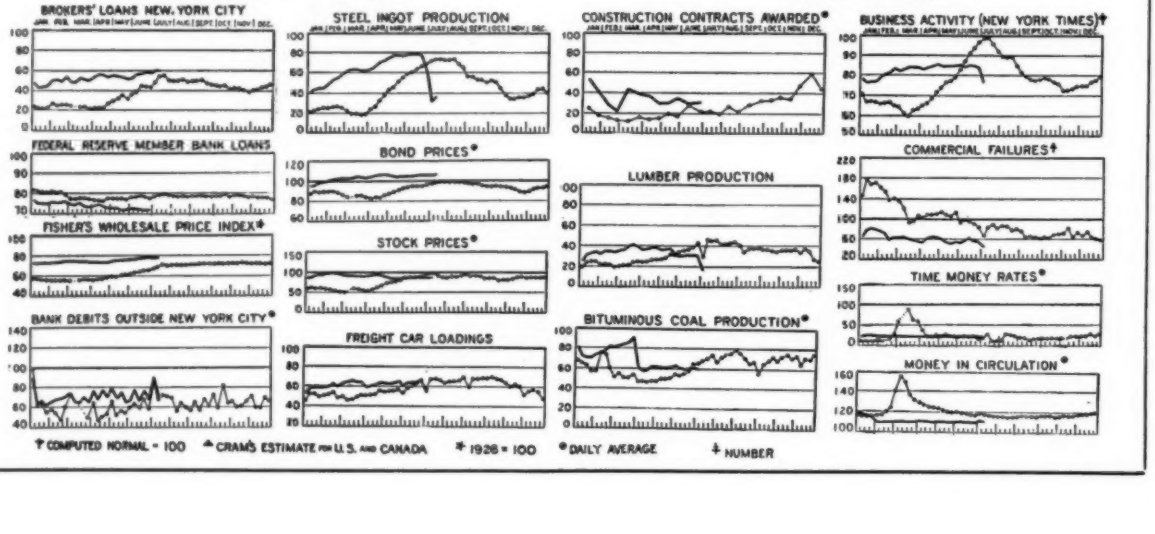
Economists characterize the demand for consumer goods as inelastic and the demand for durable goods as elastic. Most all of us realize this, since in hard times we limit our expenditures to the so-called necessities (which are almost invariably consumer goods) putting off to the future, the purchase of durable goods that we desire. The most striking illustration of the difference of character between the demands for consumer and durable goods is the diagram reproduced here from the Cleveland Trust Company's Business Bulletin for July. It shows the demand for automobiles, which is a durable good, compared with the demand for gasoline, which is a consumer good, over the period of the last five and one-half years. The chart is drawn with the average for 1929 equal to 100, and the curve is that for monthly changes in the output of both commodities, slightly smoothed and corrected for seasonal variations. The story for consumer goods and for durable goods, in general, is similar to this.



At the present time, production of consumer goods is still far below normal, but the bright spot in the picture is that, by our decreased production of durable goods during the past four or five years, we have created a possible potential need of some sixty billion dollars worth of durable goods. In other words, if the volume of the actual durable goods production were plotted for the last thirty years and from the curve a long-time trend developed, we should discover that during the last four and one-half years we did not produce sixty billions worth of durable goods that we would have produced had we followed the thirty-year trend. Accordingly, there must exist a tremendous desire for durable goods, including, of course, the production of the construction industry, which awaits a reassurance of security to transform it to demand.

The June record of construction contracts in the 37 Eastern States amounted to $127,131,200 accord-

WEEKLY BUSINESS INDICATORS



ing to F. W. Dodge Corporation. This total represents a gain of 24 per cent over the June, 1933 total of $102,341,900, but a decline of 5 per cent when compared with the preceding month's total of $134,438,700. This decline, however, is no more than the usual seasonal decline from May to June.

With reference to contemplated new construction, during June there was an increase of almost 30 per cent in the total volume of intentions to build. The month's total was $313,882,300 as compared with $241,271,200 for May and $386,259,700 for June of last year.

When examining the June contract record on the basis of the source of the funds for construction purposes it is found that there was an increase in the proportion which was publicly-financed. Of the $127,131,200 contract total awarded during June, $73,308,200 was financed from public funds, chiefly PWA. This represents more than 57 per cent of the total as compared with 53 per cent of the total for May and 28 per cent of the total for June of last year.

The first half of 1934 shows a decided improvement over both 1933 and 1932. The cumulative total for the six-month's period this year amounted to $854,320,-200 which is almost twice last year's total of $432,113,400 and 28 per cent greater than the 1931 total of $667,079,200 for the corresponding period. This improvement is emphasized when these three half-year periods are analyzed on the basis of the source of the funds spent for construction purposes. Work, privately-financed, reached a total of $282,-487,100 during the first half of this year as compared with $270,-648,600 for the first half of 1933 and $331,904,300 for the first half of 1932. Publicly-financed projects attained a total of $571,833,-100 for the first six months of this year as compared with $161,-464,800 for the corresponding period of last year and $335,175,-400 for the first half of 1932. Improvement, therefore, in the construction industry is under way and an aggressive administration of the National Housing Act should extend this improvement throughout the remaining second half of the year.

Edmund Kearsley Swigart

E. K. SWIGART

With deep regret Bucyrus-Erie Company announces the death of Edmund Kearsley Swigart on July 7th at Ballard Lake, Vilas County, Wisconsin, as the result of a heart attack. Mr. Swigart was born in Bucyrus, Ohio, on April 16, 1867. After his graduation from Toledo High School, he was in the railroad mail service for ten years. He joined Bucyrus-Erie Company in 1891 and was made Secretary and Treasurer of that Company in 1901. As Secretary he was responsible for sales, and made many friends among the contractors of those days.

In 1910 Mr. Swigart was made a Joint Managing Director of the Company, and in 1911 was made Senior Vice President, a position which he held until his death.

Mr. Swigart was also a member of the Executive Committee and Board of Directors of Bucyrus-Erie Company, a member of the Board of Directors of Bucyrus-Monighan Company, Chicago, and Chairman of the Board of Directors of the Oilgear Company, Milwaukee.

Few men leave behind them a record of achievement such as his. He was held in high regard by all who knew him and his success as a business man, a sportsman and a friend was due to his strong character, pleasing personality, unusual ability to judge human nature and his sound judgment. His business associates will long cherish the memory of this man whom they held in such high regard.

Old Times & Old Timers

(Continued from Page 369)

for some time. There were so many stakes in the ground that one couldn't tell where to begin. I started anyway. Finally an engineer came along, so I asked him. He pointed to some smoke from a little Giant about 3 miles away and said 'Head for that smoke.' I often wonder if he didn't tell the Little Giant operator the same. Jim (Dutch) Young and old Phil Ryan were my boom cats.

"One should go to Pittsburgh to meet Old Timers—Harry Anette, Bill Welsh, Tom Grady, Tom Quinlan, Bruce Graham, Bill and Jim McGovern, Bud McCabe, Bubby Burns, Bill Campbell and others. Tommy James and Henry Kane were real construction blacksmiths. 'Mush-head' Sullivan, 'Java' Boyle, 'Hog' Brady, 'Pork Chops' and 'Highball Slim' were well-known characters at that time."

Many thanks for your letter, Old Timer Pody. We were glad to hear from you.

Field Notes

(Continued from Page 371)

particularly moist, an "extra" dynamite is suitable. For deep holes in fairly dry work, the free-running blasting powders, granular loose dynamites, are economical to use.

In connection with side-hill cuts, hard rock should be blasted with quarry gelatin; softer materials with grades of extra dynamite, if dry, with a free running blasting powder, or granular black powder. "In working from the side," say du Pont men, "if the excavated material is to be used for filling, the loads should be barely heavy enough to break the ground sufficiently for convenient handling." In working from the end, the same explosives as for through-cut work should be used.

For earth side-hill cuts, it is advisable to loosen the earth with light blasts, as this will facilitate the handling of material with machines or make hand digging easier. Cuts can be widened and straightened, and gravel blasted down with extra 20% dynamite, No. 2 free running blasting powder, or if dry, with black blasting powder. If rather shallow holes are required, extra 20% or 40% dynamite should be used, while heavier, deeper work calls for quarry gelatin for hard rock. For the latter, extra grades of dynamite are also used, and, if for dry work, free running blasting powder or granular black powder.

In blasting to obtain grading material, as in a gravel pit, the spacing of the holes will be determined by the character of the material. Where rock is encountered, heavier loading must be practiced. Of course, the purpose of blasting is to loosen the gravel or earth banks to enable power shovels to work faster. For such blasting, extra 20% dynamite or No. 2 free running blasting powder is suitable.

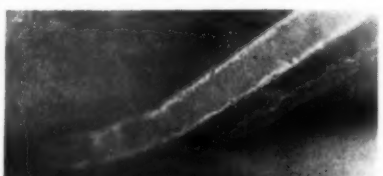
It is pointed out that, in fill settlement operations, dynamite may be used for removing unstable material from roadbeds and to make cavities for the fill to drop into; also to stir up and liquify mud surrounding the cavities to permit rapid settlement of the fill. "Ditching dynamite is particularly effective for fill settlement blasting, because of its water-resisting and propagating properties. If necessary to place explosive under a fill, use 40% gelatin in large cartridges," say the experts.

Though it is advised that technical men be consulted in order to determine the best methods for quarrying operations, general recommendations are made as follows: "To crush stone for road building, 40% extra dynamite, a low density ammonia dynamite, quarry gelatin, or a 60% special gelatin or its equivalent.

"For quarrying dimension stone, use blasting powder of fine granulation to start cracks and seams in desired directions. For extremely hard rock, quarry gelatin should be used."

The various manufacturers of explosives publish instruction books covering blasting, also various other hand books dealing with special problems. These books should be in the hands of your powder man.

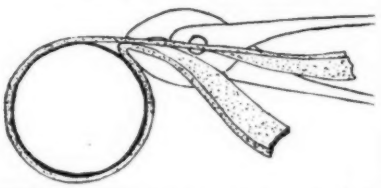
Chain Links Make Handy Lever-Block for Pry Bar



IT IS USUALLY hard to find small, tough, strong blocks to place under the neck of a pry bar when you need them. Wood in many instances is useless as it crushes under pressure. A straight piece of iron is very dangerous, as it is liable to slip, turn or allow the bar to do the same thing. Cut off three links of an old chain for such jobs. Lay them under the bar as shown. As the neck of the bar comes down on the center of the cross link to raise the load, the ends of the other two links close in tightly on both sides of the bar. Due to the rear half of the top link bearing on the sides of the other links, the blocking has no chance to move either forward or back. This is safe to use on either wood or iron surfaces for short heavy pinches.

Frank W. Bentley, Jr.

Home-Made Pipe Wrench



THE accompanying sketch shows how easy it is to make a good "pipe wrench" out of a leather strap and a pair of pliers. Wrap the strap around the article to be turned, as shown, and grasp both ends close to the article with the pliers. If it is desired to tighten the thread turn clockwise as in the sketch. If the thread is to be loosened, simply pull the other way just as with any regular wrench. This idea is of especial value where the article is nickeled or polished and must not be scratched as the leather forms a cushion between the pliers and the metal. If it is thought that a single thickness of leather will not be strong enough it is a simple matter to use two thicknesses or more. Thus the method really has no size limit, provided one has a strap that is long enough. What is more, the strap needn't be leather. Any strong, flexible material will do—even rope.

W. E. Schaphorst, M.E.

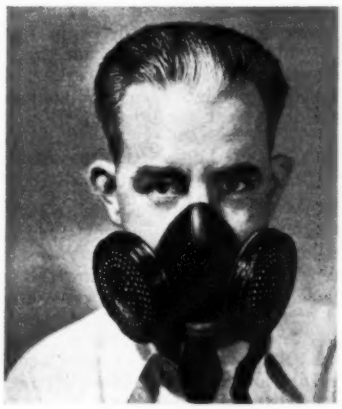
Storing Explosives

EXPLOSIVES should be stored in a dry, ventilated building, away from dwellings. They should be stored in the original unopened cases or with the cover nailed on. The cases should be off the ground and placed where children, irresponsible persons or animals cannot get at them. Fire is the greatest hazard in connection with explosives so stored. Therefore, the explosives should not be stored in shops where a forge or other sources of fire may be present. Grass and other inflammable materials should be cleared away from buildings for a distance of twenty-five feet. Blasting caps should be stored in a separate building from high explosives, and both should be placed under lock and key.

EQUIPMENT
You Ought to Know About

New Dust Mask

THE MINE SAFETY Appliances Company announces a new, patented development in dust-respiratory equipment, the MSA Comfo-Respiratory. The



company states that this device makes use of a special filter material to secure low breathing resistance and high efficiency against fine dust, without sacrificing lightness, combined with simplicity of construction, comfort and working freedom.

New Shielded Arc Electrode

FLEETWELD No. 7—a general purpose heavily coated electrode for shielded arc welding on mild steel — is announced by the Lincoln Electric Company, Cleveland, Ohio. Pronounced welding economies are effected by the new electrode, according to the manufacturers.

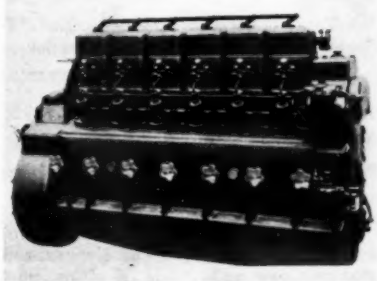
The new electrode is designed particularly for high speed and single pass welding. Its arc characteristics are such that it is particularly suitable for welds where fit-up is apt to be poor.

"Fleetweld No. 7" has a high burn-off rate and low splatter loss, providing exceptionally fast welding at low cost. The finished bead is smooth. Tests made on specimens of all-weld metal show the following characteristics: tensile strength — 70,000 to 80,000 lbs. per square inch; yield point — 55,000 to 60,000 lbs. per square inch; ductility (elongation in 2 inches) — approximately 20%; resistance to corrosion — greater than that of mild steel.

The new "Fleetweld No. 7" marks another step in the improvement of the shielded arc process. The coating is of special composition material, the metal drawn to rigid specifications, carefully selected and tested. The new electrode is manufactured in standard diameters from 1/8 inch up to 3/8 inch in 14-inch lengths and packed in 50-lb. metal containers.

Compact Diesel Engine for Small Power Users

TO MAKE the many advantages of Diesel engines available for small power requirements, Fairbanks, Morse & Co. developed the Model 36 Diesel Engine operating on the four-cycle principle and with airless injection of fuel. These engines are simple units combining easy starting with simplified installation to make them adaptable to a broad range of power requirements. Because these engines operate at comparatively high speeds and because special alloys and exclusive construction features are employed, Model 36 engines are compact and light in weight. Their adaptability and simplicity of operation make them suitable for generating power economically even when relatively small amounts are

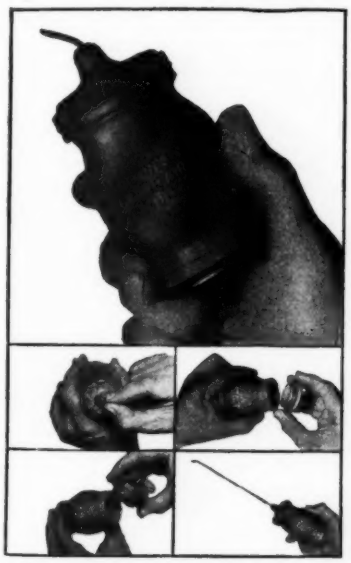


needed. Model 36 engines have been developed to start quickly in low temperatures, cranking by hand on the small units and electrically on the larger engines. They accelerate rapidly and will quickly pick up and carry their loads.

The Model 36 engine is available with one, two, three, four or six cylinders. Complete information regarding this Diesel engine may be had by writing Fairbanks, Morse & Co. at Chicago, Ill.

Please mention *Excavating Engineer* when writing for information on new equipment.

New Oilless Lubrication



THE JOSEPH DIXON Crucible Company of Jersey City, N. J., miners, refiners and manufacturers of graphited products for over 100 years, announces that through a new and novel invention in the form of a lubricating device marketed under the name of Graph-Air Gun, Microfyne Flake Graphite, a pure, lustrous, silky lubricating powder, may now be utilized for all-purpose lubricating service. The rubber Graph-Air Gun, when squeezed, deposits the graphite where needed in measured amounts through positively controlled air pressure. The measured volume is largely controlled by the position of the nozzle. The nozzle may be turned to a complete shut-off position making the Gun practical to carry in tool kits without spilling graphite. A plug fitted to the bottom of the Gun and easily snapped in and out, carries a disc of chamois for use as a burnisher.

The Gun comes filled, ready for use. When necessary to refill, the Gun head may be quickly unscrewed, exposing a large opening through which is inserted the "easy-pour chute spout" which is attached to the refill cans of Microfyne Graphite. The 2" noz-

(Continued on Page 392)

SHOTS *from the Firing Line*

Grand Coulee Dam Award

SECRETARY of the Interior Harold L. Ickes, on July 13, announced award of contract for construction of the Grand Coulee Dam and Power Plant, Columbia Basin project, Washington, to Silas Mason Co., Inc., New York City, Atkinson-Kier Co., San Francisco, California, and Walsh Construction Co., Davenport, Iowa, who jointly submitted the low bid of $29,339,301. This is the most important project to be undertaken by the Bureau of Reclamation since the Boulder Canyon project on the Colorado River in Arizona-Nevada, which was started in 1931. The necessary funds were allotted by the Public Works Administration. This project will be visited by the President this summer.

The Grand Coulee Dam on the Columbia River will be 335 feet in height and 3,400 feet long as compared with the Boulder Dam, which is 730 feet high and 1,180 feet long. Both structures contain approximately the same amount of concrete. Secretary Ickes states the purpose of the Grand Coulee project is power development only. Three 140,000 horsepower units, exceeding in size those in the Boulder plant, which at present are the largest in the world, will comprise the initial installation. Penstocks for fifteen additional units will be placed in the dam, and plugged to await increasing the height of the structure to 500 feet. It will then contain three times the amount of concrete in Boulder Dam, and complete the power plant to a capacity of 2,520,000 horsepower, which will be by far the largest plant yet built or proposed.

The Mason-Atkinson-Kier-Walsh organization accompanied their bid with certified checks for $2,000,000 in lieu of bid bond, and are required to furnish a performance bond in the sum of $5,000,000. All work under the contract must be completed in 1,650 days, and there is a penalty of $2,000 for each day of delay in completion.

F. A. Banks is the Government's Construction Engineer in charge of the work, with headquarters at Almira, Washington, which is 22 miles from the damsite.

Sand and Gravel Production Declines in 1933

THE ANNUAL REPORT of production of sand and gravel in the United States was recently issued by the Bureau of Mines. While the total commercial production fell off 17% the unit value per ton rose 5%. In 1932 the total sand and gravel used in commercial operations amounted to 85,289,076 short tons. The year's production for 1933 declined to 71,000,000 short tons. Building sand production declined 7%, paving sand 33%, and paving gravel 28%. On the other hand glass sand production increased 33%, molding sand 52%, grinding and polishing sand 69%, and furnace sand 169%.

Year's Work on Federal Highways Nearly Equals Road Around Earth

RECORD SPEED in putting highway work under way is reported by the Bureau of Public Roads, U. S. Department of Agriculture. On June 23, 1934, just one year after apportionment of the $400,000,000 highway appropriation provided by the National Industrial Recovery Act, an average of nearly $1,000,000 a calendar day had been put to work by the State Highway Departments in the construction of Public Works highways. The improvement of more than 22,000 miles of public roads and streets—a mileage sufficient to build a road almost around the world—will be the result of the expenditure.

The record of the road building operation under the supervision of the Bureau of Public Roads showed, on June 23, 1934, the following disposition of the $394,000,000 apportioned:

Status	Number of projects	Public works funds	Miles of highways
Projects completed	2,161	$ 66,040,000	6,360
Projects under construction	4,693	266,190,000	14,062
Projects awarded but not under construction	580	18,258,000	1,006
Total contracts awarded	7.704	350,488,000	21,428
Projects approved but not under contract	394	15,440,000	871
Total obligated	8,098	365,928,000	22,299
Amount apportioned		394,000,000	
Percentage of apportioned funds obligated to projects			92.9

Of the part of the $394,000,000 fund available for roads on the Federal-aid highway system outside of cities, 95.4 percent of the available money has been allotted to projects for improvement of 11,922 miles of highways, of which 4,061 miles have been completed in the year. On extensions of the Federal-Aid highway system into municipalities, 89.3 percent of the funds has been obligated on 1,813 miles of wide city streets with much complicated construction, of which 433 miles have been completed. In the secondary road program involving improvement of rural roads not on the Federal-Aid highway system 92.3 percent of the funds available has been obligated for improvement of 8,564 miles of highways of which 1,866 miles have been completed in the year.

Employment under the program totaled 246,192 men on June 23, 1934. This is only the direct employment on the roads and does not include the workers indirectly employed in quarries, mills, and factories and in the transportation of road materials, the number of which is estimated at nearly twice the direct employment.

Winners of the National Safety Competition of 1933

THE WINNERS of the National Safety Competition of 1933, in which recognition was given to notable safety records attained during the calendar year 1933 by numerous mines and quarries, were announced recently by Scott Turner, Director, United States Bureau of Mines, Department of the Interior, which sponsored the contest. Three hundred and thirty-two mines and quarries in 35 states participated in the competition. Outstanding accomplishments were achieved in the operation of mines and quarries without accidents or with quite low accident rates in 1933. The competing companies were divided into five classes; anthracite mining companies, bituminous-coal mining companies, metal mining companies, operators of nonmetallic mineral mines other than coal mines, and quarries or open-cut mines. A replica of the bronze trophy, "Sentinels of Safety", donated by the Explosives Engineer magazine, was awarded to the winning company in each group. In the group composed of quarries and open-cut mines, the winner was the Rogers City limestone quarry, Rogers City, Mich., operated by the Michigan Limestone and Chemical Company, which worked 595,416 manhours in 1933 with no lost-time accidents. This quarry also was given the

Dirt *flies* for the 10-B

There are many reasons why the new Bucyrus-Erie 10-B is proving such an outstanding success. For three years engineers designed and re-designed, built, rebuilt, tested and proved, until they were ready to release this remarkable ⅜-yard machine. Though the 10-B is startling in its performance and introduces many new features of outstanding interest, it carries no experimental design. It has been built with a background of 54 years of experience in building nearly 12,000 excavators. It is ready to go in on your job with Bucyrus-Erie's assurance that it is a thoroughly practical and dependable machine.

Weighing only 7½ to 8 tons, simple in construction, small in size, economical in price, the 10-B brings something new in mobility, power, strength, speed and dependability to the user of small excavators.

The finest of modern materials and construction go into the balanced value of the 10-B. Heat-treated, alloy steels; ball and roller bearings; welded construction; hooked rollers that eliminate the center pintle; automatic lubrication; interchangeable clutches; and a long list of other remarkable mechanical features.

Full-revolving, the 10-B offers operating efficiency and working ranges that bring real excavating jobs into ⅜-yard range. The fast digging cycle is beautifully balanced for smooth operation and big output. The controls are extremely responsive and it is easy to hold accurate grades.

You've never seen an excavator with the mobility of the 10-B. It steers like a tractor and long, short or right-angle turns are negotiated with ease. It moves readily up grades even steeper than 30 per cent; it travels at speeds to 4¼ miles per hour.

Find out about this dynamic little excavator that delivers a new kind of ⅜-yard performance.

BUCYRUS-ERIE CO.

General Offices: BUCYRUS ERIE South Milwaukee, Wis.

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For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

Shots From the Firing Line—*Continued*

highest award in this group in 1929 and 1932.

In the anthracite mining group, the winner was the Stillwater mine, in Wayne County, Pa., operated by the Hudson Coal Co. This mine was operated for 372,304 man-hours in 1933 with but 20 lost-time accidents, causing 230 days of disability.

In the bituminous coal mine group, the highest award was given to the "B" mine, Superior, Wyo., operated by the Union Pacific Coal Co., which was worked through 187,888 man-hours in 1933 without a lost-time accident.

Of the metal mines competing, the winner was the Burra Burra copper-ore mine, of the Tennessee Copper Co., Ducktown, Tenn., which was operated 303,075 man-hours in 1933 without a lost-time accident.

In the nonmetallic mineral group, first place was given to the Retsof rock-salt mine, of the Retsof Mining Co., Retsof, N. Y., which was operated through 265,120 man-hours in 1933 without a lost-time accident. This mine also was given the highest award in this group in 1929, 1931 and 1932.

Progress on Public Works Highways to July 14, 1934

PROGRESS MADE on emergency construction of public works highways to July 14 under the supervision of the U. S. Bureau of Public Roads shows a total of 8,245 projects, estimated to cost $403,572,000, had been advertised for contract, begun by day labor employed directly by the highway authorities, or completed. The cost of the day labor projects included in the above is estimated at $29,812,000.

Of the 7,892 projects awarded for construction, 4,700 were under construction on July 14 and 2,729 were completed. The work under construction, which is estimated to cost $278,628,000, was giving regular employment to 296,031 men.

In the whole country, work under way and completed involved 94.1 percent of the $400,000,000 provided for public works highways under Section 204 of the National Industrial Recovery Act.

Motor Vehicle Registration Declined Slightly in 1933

THERE WERE 23,827,290 motor vehicles registered in the United States in 1933, a decline of 1.2 percent from the previous year, according to reports from State authorities to the Bureau of Public Roads, U. S. Department of Agriculture.

Passenger vehicles in 1933 numbered 20,600,543 as compared with 20,883,625 in the preceding year. Trucks totaled 3,226,747 as compared with 3,229,315 in 1932, a decrease of 0.8 percent. There were 472,789 trailers registered in 1933 and 91,987 motorcycles.

Considering the trend of motor vehicle registration from the peak of 26,545,281 in 1930, the declines in total registered motor cars and trucks have been 2.8 percent in 1931, 6.6 percent in 1932, and 1.2 percent in 1933. Truck registration also declined in 1931 and 1932.

The total motor vehicle registration by States for 1933 and the declines or increases from the previous year are as follows:

STATE	Total Vehicles Registered in 1933	Changes in Registration from 1932 Percent
Alabama	206,361	—8.6
Arizona	89,496	—5.7
Arkansas	188,242	+37.8
California	1,958,807	—0.8
Colorado	266,491	—6.9
Connecticut	314,751	—2.1
Delaware	51,099	—2.4
Florida	279,265	—2.4
Georgia	330,147	+14.8
Idaho	96,255	+0.2
Illinois	1,463,050	—1.8
Indiana	770,071	—3.4
Iowa	632,292	—7.4
Kansas	517,987	+2.6
Kentucky	294,547	+1.1
Louisiana	232,688	—2.6
Maine	168,173	—1.9
Maryland	313,274	—2.7
Massachusetts	789,788	—1.4
Michigan	1,077,209	—5.2
Minnesota	679,243	—0.5
Mississippi	164,688	+7.1
Missouri	698,362	—2.7
Montana	110,245	+1.0
Nebraska	390,651	+4.2
Nevada	28,324	—9.7
N. Hampshire	107,631	+2.3
New Jersey	845,734	—1.1
New Mexico	76,643	—0.3
New York	2,240,757	—0.4
N. Carolina	382,308	+1.6
N. Dakota	153,889	+0.4
Ohio	1,554,314	—2.2
Oklahoma	451,712	+8.7
Oregon	239,410	—7.5
Pennsylvania	1,635,019	—1.8
Rhode Island	136,261	+2.1
S. Carolina	162,735	—7.7
S. Dakota	169,249	+4.4
Tennessee	312,180	+4.5
Texas	1,201,762	+0.4
Utah	100,362	+3.2
Vermont	73,576	—5.0
Virginia	344,704	—8.4
Washington	427,406	—4.0
W. Virginia	226,985	+0.8
Wisconsin	670,797	—3.6
Wyoming	52,560	—6.5
Dist. of Col.	149,790	—7.1
Total	23,827,290	—1.2

The 1933 Sand-and-Gravel Trophy Winners

THE 1933 winners of the national safety contest conducted annually by the U. S. Bureau of Mines in cooperation with the National Sand and Gravel Association are plants of two well-known companies—the Van Sciver plant of the Warner Co., near Philadelphia, Penn., and the Missouri River plant of the Stewart Sand and Material Co., Kansas City, Mo.

Both these operations have had three years of no-accident records—the Warner Co. plant three successive years, 1931, 1932, 1933; and the Stewart Sand and Material Co. plant 1930, 1932 and 1933. The contest was started in 1929 with 26 plant entries. Interest has grown steadily and each year more entries were made, resulting in the accumulation of much valuable data in regard to accident frequency, hazards, etc., in connection with sand and gravel plant operation. Such information was entirely lacking prior to 1929 and insurance rates reflected this absence of specific information by being higher in most instances than the hazards justified.

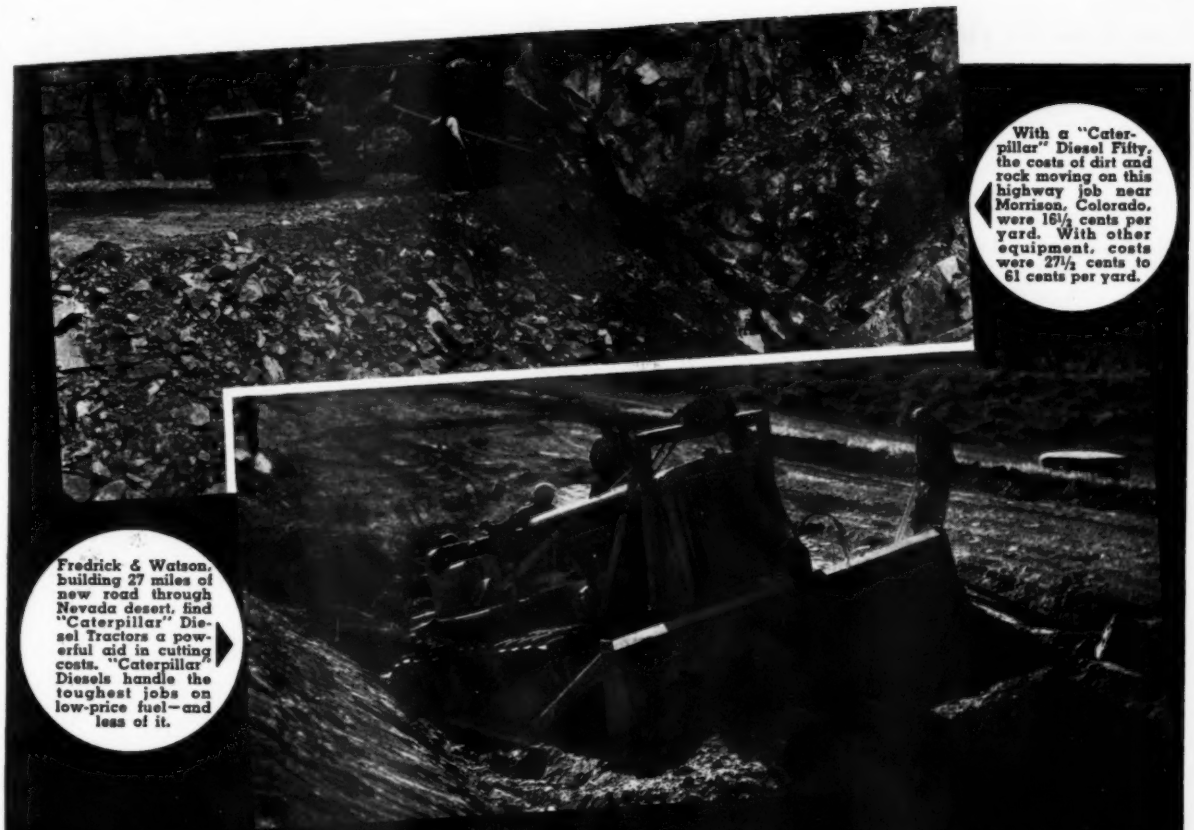
Additional PWA Money Allotted for National Parkway

THE ROUTE for a portion of the scenic parkway which has been authorized for construction from public works funds, and which will connect the Shenandoah and Great Smoky Mountains National Parks, was announced July 19 by Secretary of the Interior Harold L. Ickes. An allotment of $2,000,000 for the parkway has just been made, supplementing a previous $4,000,000 allotment. The sections authorized for construction will be from the southern boundary of the Shenandoah National Park to James River and from Adney Gap, just south of Roanoke, to Blowing Rock, North Carolina. Upon completion both sections can be utilized in advance of construction of the entire parkway by short connections with existing roads. The route from Blowing Rock to the Great Smoky Mountains National Park will be determined after proponents of suggested routes have been given an opportunity to express their views at a hearing to be held by the Secretary within a few weeks.

The route selected will provide mountain, flat plateau, interior valley, and stream-side location. It will permit relatively easy road alignment and its altitude generally will be high. The interior valleys selected will be at an elevation of 2500 feet or more.

The grade for the parkway will not be steep, the average being about 5 percent. The paving will be about 20 feet wide, with 5-foot shoulders, and the minimum width of the right-of-way will be 200 feet. When completed the parkway will be about 500 miles long, with an added 90 miles of the Skyline Drive through the Shenandoah, which it will meet at Jarman's Gap. The portion of the Skyline Drive from Thornton's Gap to Swift Run Gap already has been finished, except for surfacing. This will be completed and opened for the public by next fall. A contract has been let for the section from Thornton's Gap to Front Royal, and contracts will be awarded later for that part from Swift Run Gap to Jarman's Gap.

Secretary Ickes called attention to the difference between a parkway and a highway. Along a parkway there are



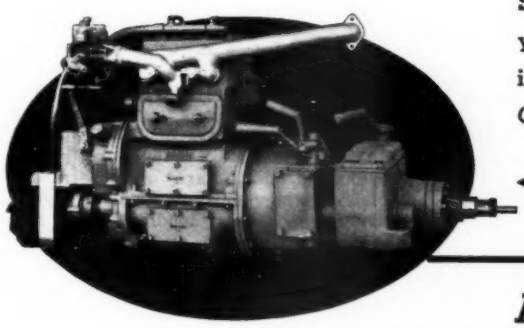
With a "Caterpillar" Diesel Fifty, the costs of dirt and rock moving on this highway job near Morrison, Colorado, were 16½ cents per yard. With other equipment, costs were 27½ cents to 61 cents per yard.

Fredrick & Watson, building 27 miles of new road through Nevada desert, find "Caterpillar" Diesel Tractors a powerful aid in cutting costs. "Caterpillar" Diesels handle the toughest jobs on low-price fuel—and less of it.

"THE 'CATERPILLAR' DIESEL IS THE GREATEST ENGINE I'VE EVER SEEN"

●● says J. H. Argerter, who operates the Moniteau County, Missouri, "Caterpillar" Diesel Tractor. He adds: "I have worked with many engines since 1920 and this Diesel tractor is beyond a doubt the best of all."

"No expense, no delay"—"Fuel costs below our expectations or even hopes"—"Not a minute's time lost"—"Lots of power, and the smoothest we've ever known"—"Simpler than a gas tractor, and better in every way." . . . Those are typical expressions from "Caterpillar" Diesel owners. Some of them bought on confidence in "Caterpillar" superiority—some on study of "Caterpillar" design and construction—now they have the proof of performance. Study the "Caterpillar" Diesel, or talk to users—either way you'll come to the conclusion that the "Caterpillar" Diesel is the surest, safest investment in power equipment. Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



Mr. R. G. Warren, Supervisor, of Hampton, N. Y., says: "The starting system can't be beat—this system (gasoline starting engine) does away with costly up-keep of batteries and is always a sure starter."

AMERICA GOES DIESEL

For your convenience in writing to Caterpillar Tractor Co., you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

restricted frontage rights, with no refreshment stands and the like, except at certain turnoffs. In places trails will be built to some of the important scenic attractions along the route.

Six Companies Low Bidder on Parker Dam

By K. CAMPBELL

SIX COMPANIES INC., submitted a bid of $4,239,834 July 26 at Los Angeles for the construction of Parker Dam. Included in the bid-price is $1,100,841 for tunnel work involving 108,000 yards of excavation and the placing of 16,000 yards of concrete. The principal items of work on the dam proper include: 2,265,000 yards of all classes of open-cut excavation, 438,000 yards of earth fill in coffer dam, 22,000 yards of riprap, 287,700 yards of concrete in structures, the placing of 1,874,000 pounds of reinforcing bars, and installing the necessary pipe, pipe fittings, spillway gates, and electrical conduit. The dam will be built on the Colorado River near Parker, Arizona, under the jurisdiction of the Bureau of Reclamation.

Vale Canal to be Let August 16

THE BUREAU of Reclamation will receive bids August 16 at its Vale office for the construction of the Vale Main Canal near Vale and Jamieson. The principal items of work are: 551,100 yards of excavation, laying 1,332 linear feet of 15-inch to 24-inch concrete pipe, and installing gates, etc. Full information may be had by writing the Bureau of Reclamation at Vale, Oregon; Denver, or Washington, D. C.

Foreign

France

The Societe Sarre et Moselle operating large coal mines around Merlebach in Lorraine use from 10 to 15,000 tons of sand daily to fill in mined-out workings underground.

● Largest List of Used Equipment appearing in any Trade Paper in the Field

For Used Equipment
see
Excavating Engineer

For Sale and Bargain Counter Section
(Pages 394-395 and 397-400)

The photograph above shows their electric Bucyrus-Erie 100-B shovel loading 12-yard Western dump cars. The shovel works in a sandstone deposit with a face varying from 65 to 115 feet in height. When in the bank, the sandstone is very solid, but the method of shooting breaks it up so that practically 75 per cent is fine sand, making favorable digging conditions. A story of this company's operations appeared in the May 1931, issue of this publication.

New England Notes

Kelleher Corporation of Turner Falls, Mass., submitted low bid of $441,701 July 10 for a road grading and surfacing project near Charlemont, Mass.

The New Hampshire State Highway Department awarded a road grading and surfacing project near Cornish and Plainfield to **Lane Construction Corporation**, Meriden, Conn., for $67,992.

The Massachusetts Department of Public Works awarded a 4-mile road resurfacing and widening project between Hatfield and Northampton to **Kelleher Corporation** of Turners Falls, Mass., for $137,650.

The Department of Public Works of the City of Boston awarded a street paving project to **Keystone Engineering and Construction Co.** of Boston for $56,833.

New York Notes

Arundel Corporation of Brooklyn submitted low bid of $254,526 June 25 for the dredging of 567,000 yards from the New York and New Jersey Ship Channel.

Pennsylvania Notes

A PWA loan and grant of $24,500,000 has been allotted to the Allegheny County Authority for the construction of the Pittsburgh-Homestead high level bridge; the Highland Park bridge; the Fort Duquesne bridge and twin tunnels including the Pittsburgh approaches and development of the Allegheny and Monongahela waterfronts on the point of land formed by the confluence of the two streams; a toll plaza at the south end of the Liberty bridge and tunnels; the Glenwood bridge; the Jerome Street bridge to McKeesport, and the North Park swimming pool. The bridges to be built were designed by George Richardson, and E. L. Schmidt, County Planning Engineer of Allegheny County. Among the materials that will be required are approximately 30,000 tons of steel, 2,000,000 barrels of cement, 250,000 tons of sand, 500,000 tons gravel, 200,000 concrete piles and large quantities of lumber.

Contractor Paul Barry, Richland, has been running shovels for the past eighteen years. He says his 10-B Bucyrus-Erie is the fastest little shovel he ever operated. Mr. Barry has been kept busy in the vicinity of Richland digging swimming pools, loading stone from quarry stock piles, and also doing considerable quarry stripping.

Freland, McHale & Patten, Inc., of Pittsburgh submitted low bid of $176,-

MOVE

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26 —rated for 1600# tools.....6-inch holes
29 —rated for 2200# tools.....6 or 8-inch holes
29-T—rated for 3000# tools.....9, 10 or 12" holes

BIT DRESSERS

No. 8.....Up to 6-inch bits
No. 12.....Up to 12-inch bits

easily . . . quickly . . . cheaply . . .

The full caterpillar mounting and faster set-up of Bucyrus-Armstrong drills cut down the moving time. So stable is the machine that practically all moves are easily and quickly made—up steep grade or across irregular or soft ground—with the derrick up. The individually driven caterpillars with pivoting axle permit a great amount of flexibility when moving and allow leveling up the machine on uneven ground for "set-up." Stabilizing-jacks are part of the machine, securely attached to the rigid frame.

Visit operations similar to yours where these new drills are at work . . . talk to their owners . . . watch them drill and move . . . ask the men on the job about their performance and the large savings they make possible.

Write for illustrated bulletin on Bucyrus-Armstrong drills and bit dressers.

BUCYRUS-ERIE CO.
South Milwaukee, Wisconsin

BUCYRUS ARMSTRONG

Blast Hole Drills

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Shots From the Firing Line— *Continued*

498 July 13 for a road and bridge project in Indiana and Westmoreland Counties.

Frank Carine & Son of Farrell was low with a bid of $38,886 on a 1.1-mile paving project in Mercer County.

Duff & Ellberg of Warren just recently completed a road project near Warren with their Bucyrus-Erie 10-B shovel. The photograph shows the machine digging clay and rock.

Celebrating an outstanding safety record that dates back to May 6, 1931, employees of the Universal, Pa., plant of the **Universal Atlas Cement Company** conducted a safety trophy rededication ceremony on July 14. The plant first won the trophy in 1930, and repeated in 1932 and 1933. In addition the plant also was awarded the Joseph A. Holmes Safety Association certificate of honor for conspicuous achievement in safety in 1930. It gained membership in the exclusive 1,000-Day club of the Portland Cement association this year when it completed on January 31 a stretch of 1,000 days unmarred by mishaps. The day of the celebration marked the completion of 1,165 days in which not a single employee at the plant had been kept from his work as the result of an accident. Superintendent R. L. Slocum and members of his safety committee, which is headed by J. R. Cline, Assistant Superintendent, were showered with congratulations on the unusual record they had achieved.

Maryland Notes

The following awards have been made by the State Roads Commission; 2.4 miles paving in Montgomery-Prince George's Counties to **Union Paving Co.** of Philadelphia for $92,653; 1.3 miles paving in Queen Anne's County for $20,030, 2 miles surfacing in Wicomico County for $15,553, .3 miles paving in Worcester County for $20,898, all to **Phillips Brothers** of Salisbury; 3.8 miles paving in Allegany County to **George F. Hazelwood** of Cumberland for $78,998.

N. L. Teer of Durham, N. C., was awarded a highway project in Hartford County for $127,981.

Baltimore and Vicinity

By S. M. CHRISTHILF

Frank Carozza and Son of Baltimore are using a Bucyrus-Erie 41-B crane on the large sewer project they are constructing in conjunction with **Michael Del Balso** in Washington, D. C.

Actual work has started on several sections of the new Philadelphia Road relocation on the boulevard between Philadelphia and Baltimore. **H. T. Campbell Sons Company** of Towson, who hold contracts for approximately 400,000 yards of grading and drainage work, have started their operations about 8 miles out of Baltimore working towards Philadelphia. The company, operating five Bucyrus-Erie machines, is expected to make real progress as soon as certain right-of-way difficulties are settled. Other local contractors who were low bidders on different sections of this proposed highway are **C. J. Langenfelder & Son** on 250,000 yards of excavation and borrow, and **Potts & Callahan, Inc.**, on 280,000 yards of excavation.

Christhilf and Ensey were low bidders for constructing 3.11 miles of Dual Highway on the road between Annapolis and Baltimore beginning at the Baltimore City limits. This project includes 78,000 yards of excavation on which they will put their 32-B Bucyrus-Erie gasoline machine.

Virginia Notes

Clinch Valley Construction Company of Tazewell was awarded a 4.3-mile road project in Spotsylvania County for $77,390.

North Carolina Notes

A "second-year" **allotment of $650,000** was made by PWA to continue work started on the Cape Fear River. This project calls for providing a protected 8-foot waterway.

South Carolina Notes

J. S. Bowers of Whiteville, N. C., submitted low bid of $89,000 for the construction of a bridge and approaches in Horry County on U. S. 117 across the Intracoastal Waterway.

Georgia Notes

At a letting held July 12 by the State Highway Board at Atlanta, the following were low bidders: surfacing 3.5 miles in Dawson County and 5.2 miles in Franklin County, **Sam E. Finley** of Atlanta for $40,573 and $66,167 respectively; surfacing 3.2 miles in Banks County and 1 mile in Tattnall County, **Jos. R. Cothian** of Atlanta for $23,232 and $22,131 respectively; and surfacing 10.9 miles in Marion County, **M. J. Carroll Inc.**, of Ocala, Florida, for $92,476.

The State Highway Department has made the following awards: 6-mile grading project in Bacon County to **W. C. Shepherd** of Atlanta for $52,230; 6.7-mile paving project in Emanuel-Johnson Counties to **Claussen-Lawrence Construction Co.** of Augusta for $141,957.

Florida Notes

An allotment of $3,700,000 was made by PWA to carry on **dredging and flood control work** on the Caloosahatchee River and Lake Okeechobee. Also $500,000 was allotted to provide more adequate facilities for commerce in Tampa Harbor.

Ohio Notes

Andrews Asphalt Paving Co. of Hamilton was awarded a street grading and paving job including sewers and waterlines in Cincinnati for $101,045.

The Commissioners of Hamilton County awarded a grading and paving project to **E. J. Knepfle Sons** of Newport, Kentucky, for $74,591.

Michigan Notes

The Automobile Club is conducting a campaign to secure by constitutional amendment a reduction in the gasoline tax from 3 cents to 2 cents per gallon and fix a limit at 2 cents; another amendment would provide for a fixed rate of 35 cents per cwt. on passenger automobiles, a reduction from 55 cents. At the last session of the Legislature

DOWN WITH HANDLING COSTS

$ $ $

In these days of keen competition, contractors must keep their handling costs at rock bottom if they expect to stay in the game.

Are you dead sure the ropes on your machines are exactly right for the purpose? Try "Flex-Set" Preformed Yellow Strand and compare results. Then you will be sure!

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YELLOW STRAND WIRE ROPE

P-46

For your convenience in writing to Broderick & Bascom Rope Co., you will find a card bound in this issue.

Shots From the Firing Line—*Continued*

the weight tax was reduced to 35 cents, saving the motorist $5,000,000 annually. Should the amendments be approved at the fall election this would reduce the receipts from the gasoline tax in Michigan about one-third or approximately $6,500,000.

Wisconsin Bridge and Iron Company of Milwaukee was awarded a cantilever bridge job in Manistee County for $122,466.

PWA has announced an **allotment of $1,000,000** to be used for dredging the St. Clair River, also an **allotment of $960,000** for similar work in the Detroit River.

Indiana Notes

J. Hoffman of Indianapolis was awarded a grading and stone surfacing contract in Spencer County for $53,709.

Kentucky Notes

The following were low bidders at a letting held July 12 by the State Highway Commission: **Ralph E. Mills Co.** of Frankfort, $48,469, for grading 4 miles in Breathitt County; and **Codell Construction Co.** of Winchester, $51,606 for grading 6 miles in Morgan County, $56,145 for grading 6.14 miles in Fleming-Lewis Counties and $20,309 for grading .4 miles and bridge in Clay County.

Tennessee Notes

The Department of Highways and Public Works has made the following awards: a bridge and approaches in Chester County for $44,044 to **Forcum-James** of Dyersburg; 3.25 miles grading in Henry County for $35,483 to the **Lebanon Bridge Company** of Nashville; a bridge in Grundy County for $34,803 to **Bell & Bell** of Nashville; 2.71 miles grading in Hardin County for $61,430 to **T. M. Strider** of Nashville.

Mississippi Notes

The Missouri Valley Bridge Co. of Leavenworth, Kansas, was awarded a contract for replacing a wood trestle approach to the bridge owned by the Vicksburg Bridge and Terminal Co., with a steel deck plate girder span with 20-foot roadway and single railroad track. The amount of the contract is $229,000.

The State Highway Commission has made the following awards: .3 miles grading and bridges in Noxubee County to **W. R. Stricklin** of Newton for $57,797; 12.7 miles (2 projects) grading and bridges in Oktibbeha-Lee-Union Counties to **Hartman-Clarke Bros. Co.** of Peoria for a total of $150,815; 9.7 miles grading and bridges in Choctow-Webster Counties to **E. A. McCaa** of Port Gibson for $66,033; and 3 miles grading and bridges in De Sota County to **Walker and Michael** of Memphis for $81,158.

Alabama Notes

Clark, Kearny & Stark Construction Company of Philadelphia, Miss., was awarded a 10-mile road job in Calhoun County for $133,252.

Wisconsin Notes

Dixon Construction Co., Albany, submitted low bid of $61,509 July 11 for the 14.2-mile grading project in Vilas-Forest counties. **Hoeppner & Bartlett Co.**, Eau Claire, was low with a bid of $100,814 for the construction of the 14th St. overhead bridge in Sheboygan County.

In getting out 200,000 tons of stones for an Indiana Harbor, Indiana, breakwater project, the **Sturgeon Bay Company** of Sturgeon find a Bucyrus-Erie 15-ton rock grab a very useful tool at their Detour quarry. The picture above shows the 15-ton grab picking up a stone estimated to weigh 18 tons. **Fitz-Simmons & Connell Dredge & Dock Company** of Chicago, have the contract for building the breakwater at Indiana Harbor.

Illinois Notes

The Department of Public Works and Buildings, Division of Highways, has made the following awards: steel bridge over Chicago Sanitary Ship and Drain Canal for $69,766 to **Strobel Construction Company** of Chicago; bridge over Des Plaines River for $83,411 to **Bates & Rogers Construction Co.** of Chicago; 7.5 miles grading (2 projects) in Fulton County for a total of $129,700 to **E. J. Eiff Company** of Quincy; and 5 miles of grading in Fulton County for $71,423 to **Birt Brothers Construction Company** of Decatur.

The Divisional Code Authority for General Contractors, Inc., Washington, D. C., has established a state administrative agency for Illinois with headquarters at Room 1819, Conway Building, Chicago, Illinois. The function of this Agency is to secure compliance with the Code of Fair Competition of the General Contractors Division of the Construction Industry. Registration of construction work in Illinois, as required by the Code, is to be made through this Agency. Application blanks for registration of contracts amounting to $2,000 or more, and copies of the Code, may be secured from the State Agency upon request.

By A. J. KOENIG

The U. S. Engineers office, Chicago, has prepared preliminary plans for **additional work on the upper Illinois Waterway.** The plans call for a new lock and dam at the upper end of Peoria Lake; a new lock and dam between Beardstown and Meridosia; and widening portions of the river from 200 to 300 feet in various counties. It is expected bids will be taken in about 60 days.

The Great Lakes Dredge & Dock Co. of Chicago was awarded a contract for dredging 119,500 yards from the North Branch and North Branch Canal of the Chicago River at a price of $63,036.

Vincennes Bridge Co. of Vincennes, Indiana, has a contract for a bridge in Williamson County.

J. L. Simmons Co. of Decatur was awarded a sewer project at Bloomfield.

St. Louis and Vicinity

By A. J. KOENIG

The War Department has announced its approval of **allotments totaling $3,679,100** required for maintenance of authorized projects throughout the Mississippi Valley division for the current fiscal year. The allotments announced were: Mississippi River between the Ohio and Missouri Rivers, $865,000; Mississippi River between Missouri and Minneapolis, and Missouri River to Clarksville, Mo., $332,500; Missouri River, Kansas to its mouth, $697,500; Illinois River mouth to Utica, $257,500; Utica to Lockport, $429,000.

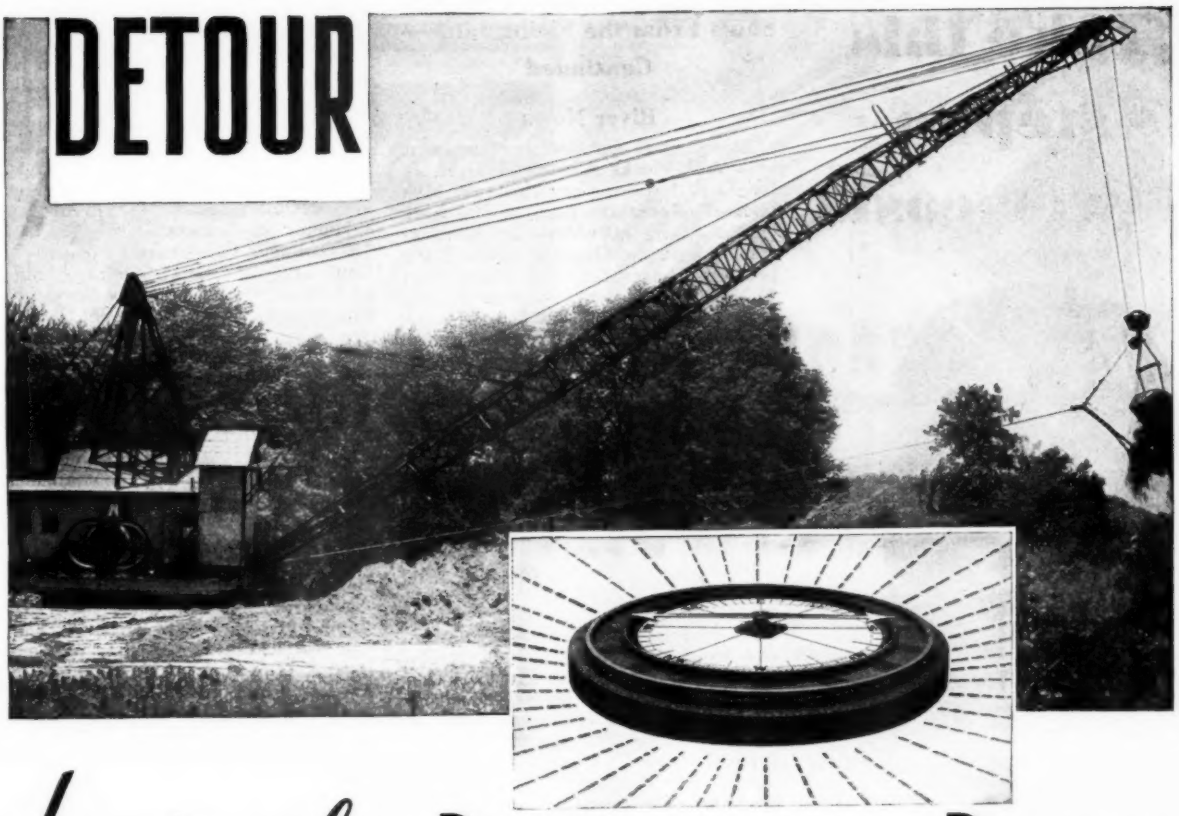
The Missouri State Highway Commission tentatively agreed to join the State of Kansas in requesting an outright grant of $612,000 from the Federal Government for the construction of a bridge across the Missouri River between the two states at Atchison, Kansas. The proposed structure would replace a toll combination railroad and highway bridge.

T. M. Cutler, Chief Engineer, Missouri State Highway Commission, reports that during the week of June 14 to June 21, 47 miles of new roadway were built, including 29 miles of graded earth, 8.3 miles of gravel, 7.9 miles of concrete pavement and 1.9 miles of miscellaneous types. This brings the total construction **since January 1st to 1,114 miles,** of which 748 miles are graded earth, 235 miles gravel, 88 miles concrete pavement and 42 miles of miscellaneous types of surface. On June 23 there were $9,659,973 in contracts under construction.

Sharp competition was noted for road contracts at the letting held in Jefferson City, Mo., July 6th. **Four hundred bids** were received on 62 projects estimated at $521,600.

W. D. Phelan & Co., Davenport, has the contract for driveway, curbing and draining in Esplanade Lock 15, Mississippi River.

DETOUR



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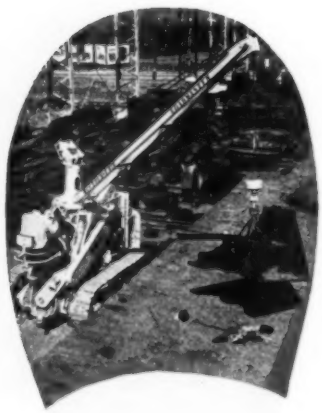

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Shots From the Firing Line— *Continued*

River Notes

According to a recent announcement by Public Works Administrator H. L. Ickes, the following amounts have been allotted to continue flood control work on the River; $15,000,000 for continuing work on the Upper Missouri River between Kansas City and Sioux City; $1,737,000 for work between Kansas City and the mouth of the Missouri River; $17,000,000 for continuing lock, dam, and channel work on the Upper Mississippi River; $1,000,000 for regulating dykes and revetments necessary to stabilize the channel and reduce future maintenance costs on the Mississippi River between the Ohio and the Illinois Rivers; $203,000 for dredging and stabilization work on the 9-foot channel in the Illinois River between the Great Lakes and the Mississippi River. The allotment for the Ohio River was $1,030,000 and work is proceeding near Golconda, Ill., Paducah, Ky., Louisville, Ky., Uniontown, Ky., and Evansville, Ind. The jobs consist of construction of new dykes, raising the crest of others, construction of back channel dykes and revetment and other channel work. The Allegheny River projects received an allotment of $240,000 for lock and dam construction and dredging. The Kanawha River projects received an original allotment of $5,315,000 for lock and dam construction near Belle, W. V., London, W. Va., Winfield, W. Va., and Gallipolis, Ohio. The new allotment of $2,200,000 will be used to construct dams near Winfield, W. Va., and Gallipolis, Ohio, where locks already are being built. It is expected that additional allotments will be announced later.

Vicksburg District

Forcum-James Construction Co. of Dyersburg, Tenn., submitted low bid of 17.44 cents per yd. July 10, on 497,000 yds. of levee on the East bank of the Ouachita River in Louisiana.

Joe W. Hendrix of Alexandria, La., was low bidder on 147,000 yds. (3 sections) at 13.45c per yd. on the same levee.

New Orleans District

The U. S. Engineers will receive bids August 8 on **886,000 yards of levee work.** Two sections (655,000 and 135,000 yards) are located in the Atchafalaya Front Levee District, the third section involving 96,000 yards in the Pontchartrain Levee District. Time allowed for completion of the largest section is 291 calendar days.

Operator P. A. Van Bramer writes us that he is working on a levee project near La Place, La., for the **Gifford-Hill Company, Incorporated.** Mr. Van Bramer is an old-time operator, having worked on excavating machinery since 1893. Glad to hear from you.

Arkansas Notes

The State Highway Commission has made the following awards: 4 miles grading, gravel surfacing and one bridge in Polk County for $56,330 to **A. C. Kennedy** of Poyen; 2 miles grading and surfacing in Polk County for $62,160 to **Ellis & Lewis, Inc.,** of Muskogee, Okla.; 1.75 miles grading and surfacing in Jackson County for $52,129 to **Rouse Construction Company** of Cape Girardeau, Mo.; 3 miles grading and concrete paving in Polk County for $39,392 to **E. B. Mooney** of Hot Springs.

Texas Notes

PWA has announced a "second year" allotment of $1,043,000 to continue improvements to the **Houston Ship Channel** at Houston. The work consists of deepening and widening the channel to full dimensions made necessary by the increasing commerce of the port.

Brown & Root, Inc., of Houston was awarded a 5.5-mile paving project in Harris County for $122,628.

An allotment of **$1,000,000 to continue work** on the lower Rio Grande and rectification of the river in the El Paso-Juarez area was announced by PWA. By agreement the United States and Mexico are attempting to control the flood waters by construction of flood channels and by shortening the length of the river.

The State Highway Department has made the following awards: 11.5 miles of surfacing in Anderson County for $27,457, bridges in Kerr County for $38,101, 18 miles of grading in Nacogdoches County for $33,764, 8.7 miles of surfacing in Smith County for $37,387 and 2 miles of concrete paving in Travis County for $23,038, all to **Holland Page** of Austin; 2.4 miles of concrete and rock asphalt paving in Bexar County for $184,459 to **H. B. Zachary Company** and **Colglazier & Hoff, Inc.,** of Laredo; two bridges on Highway 66 in Bexar County for $102,614 to **McKenzie Construction Company** of San Antonio; 7.6 miles of grading and concrete paving in Harris County for $140,926, and 7.8 miles of paving in Shelby County for $224,717, both to **Harrison Engineering & Construction Company** of Kansas City; 16.8 miles of grading and surfacing in Jasper County for $326,357 to **Austin Road Company** of Dallas; 6.8 miles of surfacing in Jefferson Davis County for $91,626 to **Lone Star Construction Company** of San Antonio; 4.4 miles of grading and structures in Kent County for $23,363, 13.4 miles of grading in Lamb County for $18,772, 9.4 miles of grading and structures in Palo Pinto County for $75,113, all to **Huddleston & Work** of Crosbytown; 15.4 miles of surfacing in Throckmorton County for $67,064, 7.2 miles of surfacing in Motley County for $20,620, both projects to **R. W. McKinney** of Nacogdoches; 10.2 miles of grading and surfacing in Kerr County for $211,738 to **W. W. Vann** of Mercedes; 2.3 miles of grading and structures including two underpasses in Montague County for $122,180 to **Austin Road Company** and

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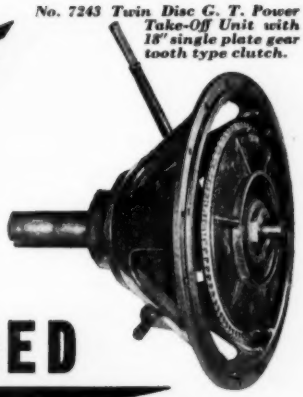

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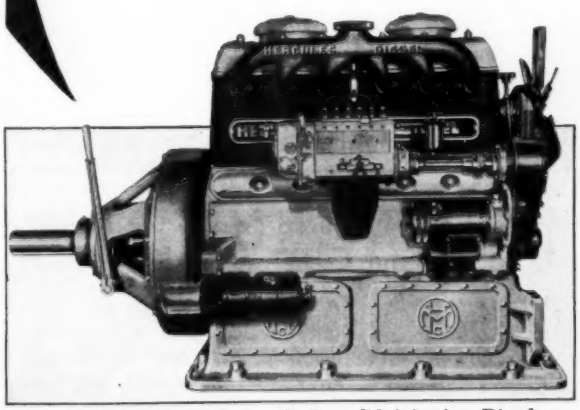

Hercules "DHXB" 5x6" six-cylinder solid injection Diesel engine, equipped with Twin Disc Power Take-Off Unit.

TWIN DISC CLUTCHES

Shots From the Firing Line— *Continued*

Austin Bridge Company of Dallas; 13.1 miles of grading and structures in Nueces County for $63,379 to **J. Lee & E. Wilbig, Inc.** of Dallas; 2.2 miles of paving in Smith County for $61,640 to **J. S. Moore & Sons** of Lufkin; and 1.1 miles of grading and concrete paving in Tarrant County for $121,407 to **Earl Yates & Son** of Dallas.

Minnesota Notes

Western Asphalt Paving Corporation of Sioux City was awarded a 6.1-mile grading project near Luverne for $58,095.

Operator Lee Sorben writes us he is running a Bucyrus-Erie 42-B shovel for **Merritt-Chapman-Whitney Corporation** on the Whitman Dam near Winona.

Iowa Notes

Carlson Construction Company of Marshalltown was awarded a 6.4-mile paving project in Jasper County for $158,308.

C. B. Taylor of Decorah was awarded two bridge and culverts in Winneshiek County for $41,600.

Colorado Notes

Here we see **Hamilton-Gleason Company**, Denver contractors, work on their section of the Bear Creek State Highway near Morrison. A Caterpillar Diesel pulls an 8-yard Athey Wagon loaded with dirt and rock from the Bucyrus-Erie 50-B steam shovel.

The State Highway Department awarded a bridge project in Elbert and Lincoln Counties to **Babb & Thorkildson** of Greeley for $77,493.

By H. M. BIBAUD

The E. M. Carlson Construction Company of Denver submitted low bid of $73,816 for the construction of six highway bridges between Rocky Ford and Ordway.

An allotment to the Reclamation Bureau of **$900,000 for construction of a drainage system** in the Basin of the San Luis Valley was announced on July 3 by the Public Works Administration. Drainage will thus be available for between 200,000 and 300,000 acres in the Basin. The water supply will come from the water shed and seepage waters from the surrounding irrigated lands.

The New Mexico Construction Company recently completed a paving job in Farmington and moved their equipment to Aztec where they will finish a similar project. The Aztec job will be completed before the end of July.

Immediate construction of the **two-million dollar Taylor Dam** on the Taylor River near Gunnison is in prospect. Public Works Administrator Harry I. Hopkins has signed a contract permitting the Reclamation Service to proceed with the project. The dam will pile up the waters in Taylor Park and will increase the water supply of the Uncompahgre Reclamation project that was established for the Montrose, Olathe and Delta communities.

A loan and grant of $469,000 has been approved by the Public Works Administration for the **Cherry Creek Flood Control Dam.** The project will cost approximately $734,183. The amount allotted by the Government represents a grant of thirty per cent of the cost and an advance of thirty-five per cent. The dam will be located one mile above Sullivan in Arapahoe County about 5.7 miles above the Denver City limits. It will be constructed of earth riprapped on the upper side, 4,000 feet long and 45 feet high. The outlet from the dam will be regulated through two sixty-foot towers. The capacity of the lake formed by the dam will be 10,000 acre feet, but this will be discharged continuously at the rate of 7,500 second feet. Engineers estimate the dam can handle a flood two and one-half times as heavy as any on record and for three times as long. Flood control plans must now be completed by the city before the work can get under way, according to City Engineer A. K. Vickery.

Fort Peck Dam

Becker County Sand & Gravel Company of Crosby, Minnesota, and **J. L. Shiely Company** of St. Paul received award to furnish approximately 1,750,000 yards of gravel for the upstream and downstream toes of the dam. Their unit price was 60c a yard F.O.B. Cole, Montana. The total price including freight was $2,625,000. McDowell-Cooley Gravel Company of Kansas City submitted a low bid of $2,362,500 but were unable to qualify.

G. L. Tarlton and **Frazier-Davis Construction Company** of St. Louis were awarded the construction of the steel sheet pile cut-off wall, involving 1,042,000 square feet of piling in place, on their bid July 9 of $2,160,000.

Grand Coulee Dam

Arcorace & Company of Seattle submitted low bid of $51,804, July 2 for the construction of the water supply and sewer systems at the camp.

David H. Ryan Company of Spokane was awarded a contract July 19 for the construction of the United States construction railroad at the Grand Coulee Dam site in Washington. The contract price is $235.570. The plans and specifications call for the building of a single-track railroad between Odair, Washington, a sideline about 2 miles northeast of Coulee City, and the Grand Coulee Dam site, a distance of about 30 miles; also a delivery yard at Odair, a siding at the head of Grand Coulee, track laying and ballasting of a single track from the head of Grand Coulee to the dam site, and a siding near the dam site. The contractor must complete the construction work in 6 months.

Practically all of the machinery, materials and equipment for use on the Grand Coulee Dam and the power plant construction, will be shipped over this railroad. One of the principal items

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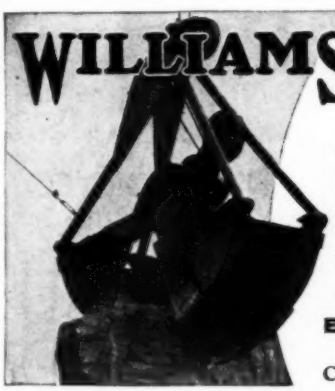

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will be 4,000,000 barrels of cement. Until the branch railroad is completed materials and supplies must be trucked in from Almira or Coulee City. The construction railroad will be operated by the contractor for the dam and power plant.

The Secretary of the Interior made this award on the basis of a decision by the Comptroller General to the effect that the bid of L. Coluccio & Company of Seattle was irregular, and that the award should be made to the next low bidder, which was the David H. Ryan Company.

Washington Notes

The Director of Highways has made the following awards; 17.9 miles surfacing in Whitman County to **J. C. Compton** of McMinniville, Oregon, for $49,887; 9.6 miles paving in Clallam County to **Erickson Paving Co.** of Seattle for $187,802; .9 miles grading and surfacing in Grays Harbor County to **R. O. Dail & Warren Bros.** of Aberdeen for $174,856; a bridge project in Chelan County to **T. D. MacNeil** of Mt. Vernon for $40,610.

The Puget Sound Construction Co. of Seattle was awarded a bridge project near Anacortes for $304,755.

Bonneville Dam Notes

In excavating the power house site on Bradford Island, **Guy F. Atkinson Company** encountered plenty of rock.

To the right of their Bucyrus-Erie 43-B gas shovel can be seen some of the huge boulders found there.

Nevada Notes

The Department of Highways has made the following awards: a bridge and approaches over the Meadow Valley Wash near Caliente in Lincoln County to **Silver State Construction Co.** of Fallon for $22,941; and a 5-mile road project in Pershing County near Lovelock to **Union Paving Co.** of San Francisco for $66,648.

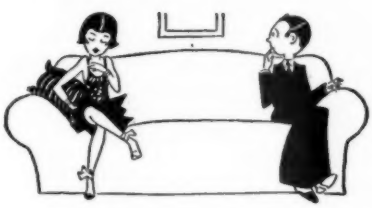
California Notes

By H. L. LIVINGSTON

The following contracts have been awarded by the California Division of Highways:

J. F. Knapp, Oakland, $168,847 for a bridge crossing the Sacramento River at Redding in Shasta County.

Peninsula Paving Company, San Francisco, $108,515 for 3.3 miles of grading and surfacing between Mustang Ridge and Priest Valley in Monterey County.



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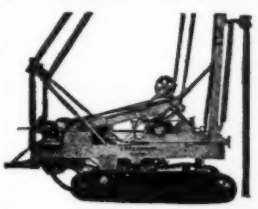

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Shots From the Firing Line—*Continued*

Hanrahan Company, San Francisco, $146,974 for 5.5 miles of grading and asphalt concrete paving between Maxwell and Delevan in Colusa County.

V. R. Dennis Construction Company, San Diego, $22,136 for 1 mile of grading and asphalt concrete paving between El Cajon and 1 mile east in San Diego County.

George Pollock Company, Sacramento, $907,365 for constructing a bridge across the Sacramento River at "M" Street.

The Public Utilities Commission, City Hall, San Francisco, has awarded a contract totaling $2,371,226 to the **Western Pipe & Steel Company**, San Francisco, and the **American Concrete & Steel Pipe Company**, Oakland, for the construction of the San Francisco Bay Crossing pipeline between Irvington Portal and the Portal of the Pulgas tunnel. This is for the Hetch Hetchy Water Supply of San Francisco.

The Santa Clara Valley voted bonds in the amount of $2,683,000 to finance construction of reservoirs, check dams, and percolating dams to increase the underground water supply in the Santa Clara Valley. A PWA loan of $2,700,000 has been applied for. Bids for this work will be called for within the next 90 days. Fred H. Tibbetts is consulting engineer for this district.

West Slope Construction Company operates three of their Bucyrus-Armstrong blast-hole drills at No. 10 quarry on the $8,600,000 San Gabriel No. 1 dam. The photograph shows three 29's working at elevation 1690.

The Los Angeles Board of Water & Power Commissioners have authorized about $8,000,000 in construction work to bring in 140 C.F.S. additional water supply to the Owens Valley Aqueduct. This work is to be done by city forces and will involve several thousand feet of tunnel and the construction of a dam.

The U. S. Engineer's office, Los Angeles, has awarded a contract in the amount of $557,790 to the **Rohl-Connolly Company**, Los Angeles, for the construction of rock jetties at the entrance to Newport Bay Harbor.

Griffith Company of Los Angeles submitted low bid of $320,755 July 25 for the construction of 5.2 miles of highway in Kern County.

Morrison & Knudsen Company of Los Angeles was low July 26 with a bid of $423,012 for the construction of a road in Yosemite National Park.

The City of Martinez received a loan and grant from P. W. A. of $50,000 for **harbor improvement and pier.**

The City of Chula Vista received a loan and grant of $151,800 for **street paving.**

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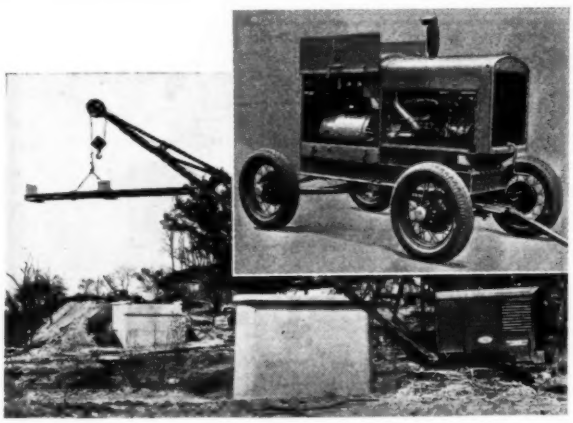
Grade 52 —For grease cups, pressure fittings and general bearing lubrication.

NATIONAL CARBON COMPANY, INC.
Carbon Sales Division, Cleveland, Ohio
Unit of Union Carbide UCC and Carbon Corporation
Branch Sales Offices:
New York • Pittsburgh • Chicago • San Francisco



Fabricate it yourself . . . for profit

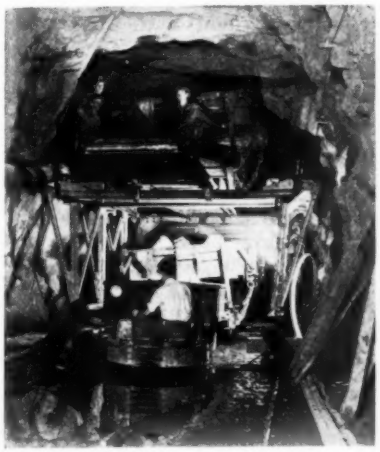
There are scores of places where you can increase your profits on a job by fabricating steel work with a P & H-Hansen Arc Welder. For highway bridges, culverts, tank work, railings, the P & H-Hansen provides low-cost welding that meets every requirement for strength. P & H-Hansens are compact, mobile, easy to operate, wide in welding range and rugged — they're built for field work. Write today for full information.

HARNISCHFEGER CORPORATION - Established 1884
4517 West National Avenue, Milwaukee, Wis.

P&H-HANSEN ARC WELDERS
BACKED BY 50 YEARS OF EXPERIENCE

Above is a picture of a Bucyrus-Erie 43-B Diesel shovel with a Buda engine owned by **Gibbons & Reed Company** of Glendale, California, at work in the Swartout National Forest Highway in the Los Angeles National Forest. This machine is working three shifts daily at an elevation of 6500 feet above sea level and is establishing fine yardage records. Frank Marten, "Hap" Earley and Frank Cody are the operators.

By K. CAMPBELL



Above is a view showing the interior of the 6,220-foot Bernasconi Tunnel, which is being dug through rock by **Hamilton & Gleason Company** of Denver. Good progress is being made in spite of the difficult digging. The picture shows a loaded car being pulled back from the mucker through the "Grasshopper". By means of this device, invented by H. J. King, General Superintendent for Hamilton & Gleason Company, empty cars are stored above the main track and are let down to the mucker as needed. This eliminates considerable delay in getting cars to the loading face. In addition, a drilling crew can operate from the front end of the machine while loading is going on.

This remarkable unit is offered in five sizes, 2½, 5, 10, 15 or 20 ton.

A better way to handle rock

For loading or placing rip rap, or handling oversize with a crane, the Bucyrus-Erie Rock Grab saves time and cuts costs. It lifts by compression --- eliminates the necessity for previous preparation --- there are no slings or chains to handle. This new grab takes hold firmly and carries the load safely to its destination where it is released easily by the operator. If you are handling rock with a crane, find out about the savings the Rock Grab can make on your job. Ask for bulletin.

ROCK GRAB

BUCYRUS-ERIE CO., Specialty Dept., So. Milwaukee, Wis.

New Mexico Notes

At a letting held July 19 by the State Highway Department the following were low bidders: **Capital Construction Company** of Santa Fe and **Dudley Stone Products Company** of El Paso, $87,544, 14 miles of surfacing in Valencia County; **A. O. Peabody** of Las Cruces, $49,953, 26 miles of surfacing in McKinley County; **Cook & Ransom** of Ottawa, Kansas, $38,925, 23 miles of surfacing in De Baca County; **Dudley Stone Products Company** of El Paso, $36,906, 19 miles of surfacing in Lea County; and **Hayner & Burn** of Las Cruces, $60,959, 87 miles, grading, paving and structures in Grant County.

Arizona Notes

By D. I. DAY

Highway construction of some kind is going on in nearly all the National Forests and Monuments of Arizona. Considerable work has been completed on the Cameron-Desert View approach to Grand Canyon National Park. The **Morrison-Knudsen** grading-draining contract and the completion of Dead Indian Canyon Bridge by **Vinson & Pringle** featured the late Spring activities. Going contracts are **O. F. Fisher's** job placing subgrade reinforcement material on about 11 miles of road from Dead Indian Canyon to the town of Cameron with J. H. Brannan, resident engineer, and work being done by the **New Mexico Construction Company** which comprises oil surfacing of about 17 miles between Dead Indian Canyon and Desert View.

Heafey, Moore & Jack Casson are going forward with 26 miles of construction from the Maricopa-Pinal County line east. The contract is for grading,

draining, placing of base course and oiling. This work is a part of the Casa Grande-Gila Bend Highway and will serve considerable traffic, local and tourist, upon completion.

Among interesting pieces of road construction and bridge jobs to be seen in Arizona are included the various bridges on the new Kaibib Forest-Navajo Bridge Highway built by **Packard & Tanner** of which the above picture shows a good example.

The **Hodgman & McVicar & Royden** job from the Navajo-Apache county line east, a distance of 18.2 miles, is anc ther interesting job. This contract covers grading, draining and surfacing. Floyd J. Beeghly is resident engineer.

Operator H. S. Alexander sent us these photographs of a road project for which the **Phoenix-Tempe Stone** Company of Phoenix has the contract to surface a section of highway 89 south of Prescott. The top view shows the Wheeling-Graham crusher plant which prepares the rock for the base course. The lower view shows one of the Lima 101 shovels digging decomposed granite and loading into 1-yard dump wagons. Operator Alexander tells us the shovel loaded 805 yards in two 5-hour shifts. The crusher foreman is Bob Keller. The other operator is Carl Cathy.

Equipment You Ought to Know About

(*Continued from Page 375*)

zle is standard with each Gun but an 8" nozzle may be secured at small extra cost.

The manufacturer will gladly send additional information and descriptive circulars without charge to those interested.

New G-E Direct-Current Motors Totally Enclosed, Fan-cooled

A NEW LINE of direct-current motors, designed for those applications where dust, dirt, moisture, or other foreign matter is present in large quantities, has been introduced by the General Electric Company. The new motors are totally enclosed and fan-cooled, and are available in a wide

variety of electrical and mechanical modifications—in sizes from ½ to 200 hp.

A system of dual ventilation is utilized. This together with water-tight conduit boxes, and labyrinth seals at the cartridge-type bearing housings effectively protects the working parts of the motor. An internal fan draws the warm air from the windings and core and circulates it around the totally enclosed interior of the motor so that it gives up its heat to the frame and end shields. An external fan draws cool air in through mesh openings in an outer end-shield and directs it over the surface of the magnet frame and inner end shields. Close clearences between the end shields and the bearing housings, and grease seals along the shaft, prevent foreign particles from entering into the motor.

These new direct-current motors are especially suited for application in locations where obnoxious process-dusts prevail, and to such apparatus as stokers, conveyors, pumps, machine tools, sand screens and shakers. They are suitable, too, for outdoor use in mild climates.

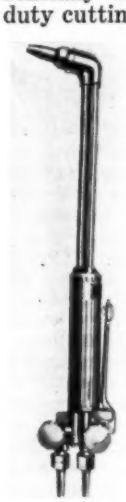
In addition to the advantages of total enclosure, these fan-cooled motors offer, as compared with totally enclosed motors, a saving in space, greater output per pound of material, economy of operation, and interchangeability with most open motors of corresponding ratings.

Calyx Core Drills

INGERSOLL-RAND announces the Class W Calyx Core Drill, a drill for boring small or large cores for exploration or other purposes. The Class W Calyx Drill will bore a core 2½" diameter, 2,500 feet deep, accurately revealing the exact nature of the rock structure. It will bore larger cores, up to 34½-inch diameter, 200 feet deep, for ventilation, de-watering, and backfilling of stopes in mines; for water wells and hydraulic elevator shafts in large buildings; for underpinning of existing building columns; for setting tubular steel piles in rock formation etc. The Calyx Drill is also used for exploring oil field structure with fish tail and core bits. Complete information regarding this drill may be had by writing Ingersoll-Rand, 11 Broadway, New York.

New Oxweld Cutting Blowpipe

THE LINDE AIR Products Company, 30 East 42nd Street, New York, has just announced a new oxy-acetylene cutting blow-pipe. This Oxweld Type C-24 has been designed essentially to serve as a general-duty cutting blowpipe, but is capable of doing heavier work if necessary, and will operate with less oxygen pressure than any preceding Oxweld cutting blowpipe. Features of this new blowpipe include an entirely new design of cutting oxygen valve, the valve being placed in an easily accessible position; a long external cutting valve lever which makes the valve easy to operate with the hand in normal gripping position; nozzles with seat protectors; closer spacing of the heating orifices about the cutting oxygen opening; new nozzle sizes; interchangeable large capacity ball-type inlet-needle-valves; and interchangeable low-pressure injector or medium-pressure mixer.



Not in the Contract

The clerk had just completed a quarter century of faithful service with a big business concern. At the end of the day the boss handed him a big envelope inscribed, "In token of this memorable date." The clerk opened the envelope and inside it he found a photograph of his employer.

"Well, what do you think of my gift to you in recognition of your devoted service?" the proprietor asked.

"It's just like you," was the ambiguous reply.

Butcher: "I can't give you further credit. Your bill is bigger now than it should be."

Customer: "I know it. Just make it out for what it should be and I'll pay it."

Jones usually sported a rather handsome gold watch, but circumstances forced him to pawn it.

A friend met him on the street one day and asked him the time of day, and noticed that he had a new watch.

"That's not the one you usually carry," said the friend, "the other one had a gold case."

"I know," said Jones sadly, "but circumstances sometimes alter cases."

The two girl attendants at the cigar counter were discussing their last customer. "Did that tall, handsome traveling man that you were just talking to over there in the corner take a Post?"

"Naw, he didn't buy a Post but he took a few Liberties."

Lecturer:—"Can anyone tell me what makes the Tower of Pisa lean?"

Stout Lady:—"I don't know or I'd take some myself."

Census Taker:—(to Negro woman) What is your husband's occupation?

Mandy:—Lawse, mistah, mah husband's been dead fo'teen years.

C. T.:—Whose small children are these?

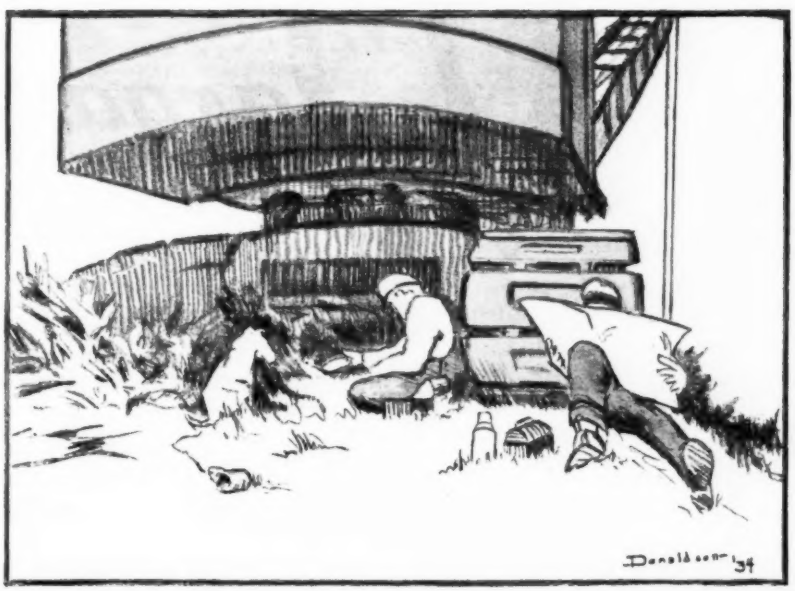
Mandy:—Dey's mine.

C. T.:—But I thought you said your husband has been dead fourteen years!

Mandy:—He is, but ah ain't.

He: Let's get married or sumpthing.

She: We'll get married or nothing!



The Operator (feeding the outcast):—"Sooner, don't you be downhearted. From what Bill here has been reading me, some of these professors don't know 'Sick 'em.' either."

A colored county preacher who was strong on visiting the female members of his flock, was traveling along the road to the home of one of his flock when he met the small son of the lady member.

"Where's your Maw?"

"She's home."

"Where's your Paw?"

"He's home."

"Tell 'em 'howdy' fuh me."

Scrub:—"Is the captain double-jointed, sir?"

Coach:—"No, why?"

Scrub:—"I just broke his leg, then."

Conductor:—Madam, you'll have to pay a fare for that child; he is over six years of age.

Madam:—But I've been married only five years.

Conductor:—Never mind the true confesssions—gimme the money.

"Oh, Fred, the baby has swallowed the matches. What shall I do?"

"Here, use my cigarette lighter."

"Oy Oy, Lemmel, vat you t'ink? I was arrested today for speedink."

"Vat, you? Vy, I didn't know you had a car."

"No, no, not dat. Speedink—speedink—on der sidewalk."

Dorothy: And if I go over in that nice dark corner, will you promise not to hug me?

Joe: Yes.

Dorothy: And not to kiss me?

Joe: Yes.

Dorothy: Then what do you want me to go over there for?

She:—Why are so many men going to the Hawaiian Islands this summer?

He:—Because the grass crop was a failure.

Shovel Operator:—"You look lovelier to me every minute. Do you know what that is the sign of?"

Girl:—"Sure, you're going to run out of gas any minute."

First Pitman:—"Do you know how to make a standing broad jump?"

Second Pitman:—"I suppose sticking her with a pin would do the trick."

Cookee:—"I can tell a lady by the way she dresses. Can't you?"

Bull Cook:—"I never watched a lady dress."

Judge (in traffic court): "I'll let you off with a fine this time, but another day I'll send you to jail."

Driver: "Sort of a weather forecast, eh, Judge?"

Judge: "What do you mean?"

Driver: "Fine today—cooler tomorrow."

EXCAVATING ENGINEER Bargain Counter

★ ★ ★ **THE ITEMS LISTED on these pages have been selected because they offer unusual values to the man who is looking for a bargain. Some of this equipment is surplus stock which has never been used, some is rebuilt and carries new equipment guarantee, some is just plain used. But every item is priced for quick sale. If any of this equipment fits your needs send a postcard or letter, mentioning the reference number, to *Bargain Counter, Excavating Engineer, South Milwaukee, Wisconsin.* We'll pass your inquiry along to the owner and you will receive price and complete information promptly. Act now — with advancing prices on new stock this equipment will move fast.**

SHOVELS-CRANES DRAGLINES

P&H MODEL 208—45' BOOM DRAGLINE—Cats—15½' long, 9' wide, 22" Treads. 100 HP. Waukesha High Alt. Engine. SCD-1.

P&H MODEL 208—45' BOOM DRAGLINE—4-cylinder 7¾"x9" Twin City gasoline engine and 1½ cu. yd. Omaha bucket. SCD-20.

BUCYRUS-ERIE 30-B DIESEL 40' BOOM DRAGLINE. SCD-21.

MONIGHAN MODEL 1-W WALKER—60' Boom Dragline, 1¾ cu. yd. Page Bucket. Good condition. SCD-13.

MEAD-MORRISON GASOLINE COMBINATION SHOVEL-CLAMSHELL. ½ cu. yd. Dipper, 17' Dipper handle—18' Boom—32' Clamshell Boom and 1½ yard Erie Clamshell Bucket. 5"x6" 4-cyl. Wisconsin Engine. Good mechanical condition. Bargain Price. SCD-28.

BAY CITY "PUP" GASOLINE CLAMSHELL. Good mechanical condition. SCD-24.

BYERS "BEARCAT" Gasoline ⅝-yard Shovel. Hercules engine. Overhauled. Good mechanical condition. SCD-25.

THEW-UNIVERSAL MODEL 35 — Gasoline — ½ cubic yard standard shovel equipment—25' lattice type crane boom and ½ yard Williams bucket with teeth—complete drag shovel attachment and skimmer scoop bucket, including home-made trailer. Excellent condition. SCD -26.

BUCYRUS-ERIE MODEL 30-B DIESEL SHOVEL—25'9" Boom, 14' Dipper Handle, 1 yd. Dipper. SCD-9.

KOEHRING MODEL 1—30' Boom Gasoline Crane. Cat Mounted—No Bucket—4½"x5" Wisconsin Engine. SCD-19.

GENERAL GASOLINE ½ CU. YD. SHOVEL—Buda 4-cyl. 4½"x6" Gasoline Engine. Only handled about 75,000 cu. yds. A-1 operating condition. SCD-27.

Shovel Equipment

¾ CU. YD. DIPPER—20' boom—13' Dipper Handle—rope crowd shovel equipment. Suitable for models 1030 or 1035—brand new. SE-1

¾ CU. YD. DIPPER—23' BOOM—15' DIPPER HANDLE—Extra High Lift Rope Crowd Shovel Equipment suitable for Models 1030 or 1035. Brand New. SE-2.

COMPLETE FRONT END EQUIPMENT

¾ CU. YD. DIPPER—23' BOOM and ENGINE —12'6" DIPPER HANDLE—Shovel Equipment suitable for 20-B Steam. Brand New. SE-15.

¾ CU. YD. DIPPER—26' BOOM and ENGINE —17' DIPPER HANDLE — High Lift Shovel Equipment suitable for 30-B Steam. Brand New. SE-16.

¾ CU. YD. DIPPER—25'9" BOOM—14' DIPPER HANDLE—Shovel Equipment suitable for 30-B Diesel. Brand New. SE-17.

⅞ CU. YD. DIPPER—21'9" BOOM and ENGINE—15' DIPPER HANDLE — High Lift Shovel Equipment. Suitable for 31-B Steam. Brand New. SE-18.

1 CU. YD. DIPPER—20' BOOM—15' DIPPER HANDLE — Rope Crowd Shovel Equipment. suitable for Osgood "Conqueror." Good mechanical condition. Low Price. SE-24.

1 CU. YD. DIPPER—23' BOOM—12'6" Dipper Handle—Rope crowd shovel equipment. Suitable for D-2 machine. Brand new. SE-4

1 CU. YD. DIPPER—24' BOOM—18' DIPPER HANDLE—Slightly used but good conditioned. Suitable for any Bucyrus-Erie GA-2 or GA-3 Machine. SE-25.

1 CU. YD. DIPPER—24' BOOM—16' DIPPER HANDLE—Rebuilt and Guaranteed. Suitable for application Bucyrus-Erie GA2 or GA3 Machines. SE-26

1¼ CU. YD. DIPPER—22'6" BOOM—16' DIPPER HANDLE—Rebuilt and Guaranteed. Suitable for application Bucyrus-Erie GA2 or GA3 Machines. SE-27

1¼ CU. YD. DIPPER—25' BOOM—17' DIPPER HANDLE—Slightly Used Rope Crowd High Lift Shovel Equipment suitable for Model 37-B. **New Machine Guarantee.** SE-5.

1½ CU. YD. DIPPER—23'6" BOOM—15' DIPPER HANDLE—Slightly Used Rope Crowd Shovel Equipment suitable for Model 37-B. **New Machine Guarantee.** SE-6.

1½ CU. YD. DIPPER—27' BOOM—17' DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment suitable only for Bucyrus-Erie 43-B machines. **Rebuilt—New Machine Guarantee.** SE-23.

Dragline Equipment

35' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-2.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-3.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. Brand New. DL-6.

45' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. **Brand New.** DL-7.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. **Brand New.** DL-8.

45' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. **Brand New.** DL-9.

BRAND NEW Ropes included with each of above Dragline Equipments.

All of above equipment is BRAND NEW and of BUCYRUS-ERIE manufacture.

Skimmer Scoop

¾ CU. YD. DIPPER—20' Boom together with all necessary ropes and material to completely convert Bucyrus-Erie 1020 Shovel, Clamshell or Dragline to Skimmer Scoop Machine. Brand New. Shipment 2 to 3 weeks. SS-1.

Trench Digging Equipment

1 CU. YD. 42½" WIDE—Solid type Dipper—24' Boom and all auxiliary equipment. Will dig maximum depth 22'. For application to GA-2 or GA-3 Shovel. **Rebuilt—New Machine Guarantee.** DS-5.

BRAND NEW PAGE, two dippers each ¾ cu. yd., one 35" wide over cutters, the other 49½" wide over cutters. 17'1½" Boom and all necessary auxiliary equipment. Will fit Bucyrus-Erie 1030 or 1035. DS-7.

1-CU. YD. 42½" WIDE SOLID TYPE DIPPER —24' Boom and all auxiliary equipment—will dig maximum depth of 22'—For application to GA-2 or GA-3 Clam Shell or Drag Line. Rebuilt —New Machine Guarantee. DS-8.

BRAND NEW Ropes included with each of above Trench Digging Equipments.

DIPPERS

Small Machines

2 ⅝ CU. YD.—Plate.—Will fit 20-B Steam or Gas. Brand New. D-12

1 2/3 CU. YD.—Plate front.—Will fit 14-B. Brand New. D-13

1 ¾ CU. YD.—Rock Type.—Will fit 20-B Steam or Gas. Brand New. D-15

1 ¾ CU. YD.—Plate front.—Will fit 1030 or 1035. Brand New. D-16

2 ⅞ CU. YD.—Plate front.—Will fit 1030 or 1035. Brand New. D-18

1 ⅞ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 1030 or 1035. Slightly used. D-36

1 ⅞ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 1030 or 1035. Brand new. D-37

1 ⅞ CU. YD. Cast Front Inserted Tooth. Will fit B—B-2—B-3 and GA-2. D-19

1 ⅞ CU. YD.—Plate Front. Will fit 18-B. Brand New. D-20

1 ⅞ CU. YD.—Rock type. Will fit 31-B. Brand New. D-21

2 1 CU. YD.—Cast Front Inserted Tooth Dippers. Rebuilt and Guaranteed. Suitable for application GA2 or GA3 Machines. D-34

1 1¼ CU. YD.—VAN PORT—ROCK TYPE. Will fit E-2, 41-B or 42-B. Slightly Used. D-26

2 1¼ CU. YD.—VAN PORT—ROCK TYPE. Will fit E-2. Brand New. D-27

1 1¼ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 37-B. Slightly used. D-38

1 1½ CU. YD.—PLATE. Will fit E-2. Brand New. D-28.

1 1½ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 43-B. Slightly used. D-39

2 1½ CU. YD.—Manganese Front Inserted Tooth. Will fit E-2, 41-B or 42-B. Slightly Used. D-29

1 1½ CU. YD.—Vanderhoef type with Vanderhoef teeth. Will fit E-2 or 42-B. Slightly Used. D-30

Large Machines

1 2½ CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on 68-C and 70-C machines. Brand New. D-1.

2 3 CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on Model 100-B, 68-C, 70-C Machines. Brand New. D-2.

1 3½ CU. YD.—Front 2¾" Nickel Chrome Steel, two part Van Port Reversible Teeth. Can be used on Model 88-C, 95-C, Class 180. Brand New. D-3.

1 4 CU. YD.—Front 2¾" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Has seen some service but in good condition. Can be used on Model 100-C, 120-B. D-4.

1 4½ CU. YD.—Lip 2¼" Manganese Steel, two part Reversible Manganese Teeth. Can be used on Model 88-C, 110-C. Brand New. D-5.

3 6 CU. YD. Molybdenum Steel Front, Annealed Cast Steel Back, two part Reversible Van Port Teeth. Can be used on 225-B and 320-B. Brand New. D-11.

1 8 CU. YD.—Front Molybdenum Steel, two part Van Port Reversible Teeth. Can be used on Model 320-B. Slightly Used but excellent condition. D-6.

DRAGLINE BUCKETS

BRAND NEW

1 ⅝ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 890 lbs. DB-11

2 ¾ CU. YD. PAGE CLASS "C." Approximate weight each 2425 lbs. DB-1

1 1½ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 2900 pounds. DB-15

3 2 CU. YD. PAGE CLASS "C." Approximate weight each 5630 lbs. DB-4.

1 2 CU. YD. OMAHA STANDARD. Approximate weight 4300 lbs. DB-5.

1 2¼ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 3850 lbs. DB-13.

1 2½ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 4600 lbs. DB-14.

REBUILT

1 1¾ CU. YD. OMAHA STANDARD. Approximate weight 3800 lbs. DB-7.

1 2 CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 3200 lbs. DB-12.

1 2½ CU. YD. BUCYRUS-ERIE INSERTED TOOTH. Approximate weight 6500 lbs. DB-9.

1 2½ CU. YD. OMAHA STANDARD. Approximate weight 5400 lbs. DB-10.

BOILERS

BRAND NEW

Will Make That Old Shovel Work Like New.

Can Also Be Used for Miscellaneous Service.

Vertical Type

3 42"x88"—35 H.P.—144 lb. Working Pressure. Mass. Std. Will fit Type B Shovel. B-2.

1 44½"x88½" fitted with extended fire box for burning wood. Can be used for coal or coke. 37 H.P.—144 lb. Working Pressure. ASME Std. Can be installed on Type B Shovel. B-3.

1 44½"x88½"—37 H.P.—145 lb. Working Pressure—Canadian Standard. Will fit B or B-2. B-4.

1 46½"x88½"—37 H.P. 150 lb. Working Pressure. Massachusetts Standard. Will fit any B-2 or B-3 Machine. B-7.

3 46½x110"—40 H.P.—155 lb. Working Pressure. Special Wood Burning Fire Box. ASME Std. Will fit any B-2 or B-3. B-9.

1 54"x100"—41 H.P.—125 lb. Working Pressure. ASME Std. Will fit B-2 or B-3. B-11.

1 58"x7'9'--70 H.P.—150 lb. Working Pressure. Mass. Std. Will fit 42-B Machine. B-12.

Locomotive Type

3 44"x17'—75 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 68-C. B-13.

1 44"x18'—88 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 70-C. B-14.

2 54"x11'3"—92 H.P.—125 lb. Working Pressure. ASME and Mass. Std. Will fit Model 50-B Machine. B-16.

ELECTRICAL EQUIPMENT

MOTOR—GENERAL ELECTRIC—3 phase, 25 cycle, 550 volt, 1500 RPM., 90 HP., BRAND NEW. EE-1.

50 KW MOTOR GENERATOR SET—GENERAL ELECTRIC—consisting of 3 phase, 60 cycle, 440 volt, 1170 RPM., 75 HP., Induction Motor connected to 50 KW, 250 volt, 1200 RPM., Generator, including suitable rheostat and compensator. BRAND NEW. EE-2.

COMPENSATOR — GENERAL ELECTRIC—75 HP., 2220 volt, 3 phase, 25 cycle, manual type. BRAND NEW. EE-3.

TRANSFORMER—GENERAL ELECTRIC — 5-KVA. 2200-3810 volt primary, 440-220 volt secondary—3 phase, 60 cycle, with cast iron tank and cover, including specially fastened bushings to prevent oil leakage. BRAND NEW. EE-4.

GENERATOR — WESTINGHOUSE — 125 KW, 250 volts, 500 amperes. Direct Current. 440 RPM. Includes two outboard bearings. BRAND NEW. EE-5.

MOTORS (2) — GENERAL ELECTRIC — 21.5 H.P. 3 phase, 60 cycle, 440 volt, 900 RPM. Totally enclosed—ball bearing. BRAND NEW. EE-6.

AIR COMPRESSORS

1 BRAND NEW WORTHINGTON——METAL-WELD—2-cylinder 7"x6" Vertical 162 cu. ft. piston displacement, Air Compressor. Fitted with Laidlaw feather valves—Lugs on side for mounting on skids or channels—Shaft extended and equipped with semi-flexible coupling to take 2⅝" drive shaft—Force feed lubrication. Automatic control. Includes 1" High capacity centrifugal circulating pump—"V" belt driven—18"x41" Air Receiver, 100 pounds working pressure. A.S.M.E. Standard. Electric or gasoline power required approximately 30 H.P., approximately 1000 R.P.M.—Compressor Speed approximately 550 R.P.M. — Overall dimensions: — Height 45"—Length 37½"—width 28". AC-3.

2 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Brand New. AC-1.

1 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressor with fittings. Used. Make offer. AC-2.

ENGINES

Designed especially for application to Excavating or similar Equipment. Can be used for stationary or semi-stationary service.

Diesel

2 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—5-cylinder, 9" bore x 10½" stroke, 150 HP at 450 RPM, 4 cycle, Vertical—valve in head type. Dust proof, Oil tight crank case and forced lubricating system. Also auxiliary air starting equipment. DE-2.

4 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—3-cylinder 6" bore x 8" stroke, 45 H.P. at 650 R.P.M., 4-cycle, Vertical—valve-in-head type. DE-5.

3 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—4-cylinder, 6" bore x 8" stroke, 60 H.P. at 650 RPM. DE-6.

Gasoline

1 MODEL HH-U NOVO—16 H.P. ENGINE—4-cylinder, 3⅜" x 4"—1200 R.P.M.—Radiator cooled—complete power plant—mounted on channels—sheet metal housing—extended crank shaft 1⅞" diameter, including outboard bearing with Fafner ball bearing. GE-1.

1 MODEL D-3 WISCONSIN SIX CYLINDER 5½" x 6½" GASOLINE ENGINE — Complete with radiator, carburetor and accessories—Rebuilt—Like new. GE-2.

Steam

1 12½"x16" link reversing type for Railroad Shovel. ME-1.

2 4½" x 5" reversible — —20.8 HP at 400 RPM. 100 lb. Pressure. ME-2.

1 4¾"x5" reversible—23.2 H.P. at 400 RPM. 100 lb. Pressure. ME-3.

2 5"x5" reversible—25.6 H.P. at 400 R.P.M. 100 lb. Pressure. ME-4.

1 "LITTLE TUGGER" INGERSOLL RAND STEAM HOIST ENGINE. No. 1-H-5-2½ H.P. ME-5.

TRAILERS

1-14 TON WILLIAMS "ECONOMY" TRAILER. Arch Girder Construction—Safety Chains—Rear Loading ramp. Solid Rubber tired wheels 28"x10" front 28"x16" rear. Deck dimensions 12'x7'9"x31½" high. Brand new. T-1.

PUMPS

1 NB — 3 STAGE CENTRIFUGAL PUMP — 2" suction and discharge — bronze impeller and shaft—capacity 100 gallons per minute at 240' head operating at 1720 RPM or 270' head at 1780 RPM. Now equipped for belt drive but can be operated by 15 HP Electric Motor. ME-6.

SOLID RUBBER TIRES

FOUR—40"x8" "HOOD" solid rubber heavy duty—Used for demonstration only—Good as new—Price very reasonable. RT-1.

Book Reviews

A new catalog covering the complete line of **oil circuit breakers** up to 50,000 Kv-a. has recently been issued by the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

A bulletin listing the complete line of all sizes and types of **Jackbits** has recently been issued by **Ingersoll-Rand Company**, 11 Broadway, New York. The bulletin is profusely illustrated, and describes the Jackbit and Jackbit Rod, showing a number of unretouched photographs of Jackbits, both with center and side holes, and in the 4-point and 6-point style. It is now possible to use Jackbits and rods on many jobs where it was previously uneconomical.

A new illustrated leaflet describing type **CR single phase repulsion-start induction motors** has been issued by the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa. These motors are available for 110-220 volt, 25-50-60 cycle service in sizes from ¾ to 3 horsepower. They are especially designed for heavy industrial service.

Bronze - Welding — An eight - page pamphlet entitled, "The Progress of Bronze-Welding" has just been published by **The Linde Air Products Company**, 30 East 42nd Street, New York, N. Y. It contains a comprehensive and instructive story of bronze-welding in all its phases with the subject matter arranged so that procedures for work on cast iron, malleable iron, steel and wrought iron, copper, and brass and bronze are each discussed in a comprehensive manner. A special section is devoted to the building-up of worn surfaces, which is one of the most important uses of bronze-welding today. A copy may be had by writing the Linde Air Products Company.

A four-page leaflet describing their complete line of **explosion resisting motors** in ratings up to 200 horsepower has recently been published by Westinghouse Electric and Mfg. Company, East Pittsburgh, Pa.

Three new publications describing the new line of Westinghouse **fractional horsepower motors** have recently been released. **Leaflet 20606** describes type FS polyphase squirrel cage motors for all voltages and frequencies, two and three phase, ⅛ to ¾ horsepower ratings. **Leaflet 20604** describes type FR repulsion start induction motors for high torque, constant speed service. They are rated for single phase, 110 and 220 volt, ⅛ to ¾ horsepower service. **Leaflet 20605** describes the type FK direct current motors for shunt compound and series wound service. They are rated for 32, 115 and 230 volt, 1/30 to ¾ horsepower service. Copies of the publications may be obtained from Westinghouse Electric and Manufacturing Company, Advertising Department, East Pittsburgh, Pa.

Testing Welders and their Welds—A 24-page illustrated booklet recently published by **The Linde Air Products Company**, 30 East 42nd Street, New York, N. Y., outlines simple tests for measuring the ability of welders. Separate sections of the book discuss in detail the fracture test, the bend test, the tensile test, and the observation test. A summary of existing and pending qualification tests for welding steel plate and pipe are given. This includes: the A.S.M.E. Unfired Pressure Vessel Code for both Class 2 and Class 3 welded constructions, the A.S.A. Pressure Piping Code (unofficial) and the specifications and standards covering welding of steel and wrought iron pipe of the Heating and Piping Contractors National Association. A copy of the booklet can be had by writing the Linde Air Products Co.

Tractor-Mounted Welder—A four-page leaflet describing FlexArc Cletrac Welders for remote construction and maintenance jobs has been issued by the **Westinghouse Electric & Manufacturing Company.** The leaflet describes fully distinctive features, operation, construction, and application of this welder. Copies are available through the nearest district office or direct from the advertising department, East Pittsburgh, Pa. Please mention Excavating Engineer.

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THE KOENIG LABOR AGENCIES

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POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

OPERATOR

Thirty years experience on coal stripping, railroad and highway construction. Prefer coal stripping anywhere. Can do own repair work and furnish best of references. Married. Present location, Pennsylvania. Box 6501.

SHOVEL OPERATOR

14 years' experience on railroad, highway and coal stripping. Prefer big coal stripper. Can do own erecting and repairing. Willing to go anywhere on short notice. Can furnish best of references. Present location Alabama. Box 6300.

EXPERT DRAGLINE AND SHOVEL OPERATOR

16 years' experience as shovel operator. Married, 36 years of age. Have operated practically all makes of machines, and have 10 years' experience as dragline operator. Can handle steam, Diesel, electric or gasoline machine. Have worked on highway and railroad grading, rock excavation in quarry, drainage and irrigation and dredging and also gold dredging. Prefer position on Bucyrus-Erie E-2, D-2, or 50-B or other Bucyrus-Erie machines. Have also operated Class 220 and 225 electric and Diesel electric machines. Capable of taking charge of repairing and erecting and can handle crews. Best of references and can do own repairing. At present located in California, but will go anywhere. Box 5507.

ENGINEER-SUPERINTENDENT WANTS CONNECTION WITH CONTRACTOR

Twenty years' exceptional experience in factory construction, rock work, roads, dams, tunnels, hydro-electric developments, foundations. Has produced results under difficult conditions and can handle large program in whole or part. Eight years Latin America. Go anywhere. Box 5102.

SUPERINTENDENT

20 years operating and in charge of heavy strip mine and quarry equipment. 45 years of age. Can furnish references from any former employer and the largest manufacturer of excavating equipment in America. Can take full charge on reasonable notice. Box 5901.

OPERATOR-QUARRY FOREMAN

Have 25 years experience operating steam, electric and gasoline shovels and draglines on all classes of work. Can do own repair work. Also experienced quarry foreman with very best references. Married but willing to go anywhere. Present location Kentucky. Box 6200.

EXPERIENCED DRAGLINE OPERATOR

Fifteen years' experience on Bucyrus-Monighan, P&H, Northwest and other makes of Steam, Diesel, gas and electric draglines on levee work and phosphate mines. Hold three sets civil service papers with ratings of 70%, 85%, and 100%. Married but can go anywhere. Furnish excellent references. Present location, Louisiana. Box 5903.

POSITION WANTED

College civil engineering student living in Milwaukee, Wisconsin, desires practical summer work with small pay on some small job such as shovel oiler, waterboy, flagman, rodman, or stakeboy for surveying, timekeeper, clerk, etc., preferably somewhere in Wisconsin. Two years' experience in surveying at college. Can furnish references. Box 6600.

WANTED OWNER-OPERATOR

Reliable experienced mining executive wants operator with shovel for working rich placer gold property promising large profits. Box 6701.

STEAM SHOVEL OPERATOR

14 years experience with steam machines only on Railroad and Highway grading, coal stripping, Rock Quarry and Gravel Pits. Can do own repair work, furnish references and willing to go anywhere. Present location, Tennessee. Box 6700.

GAS OR STEAM SHOVEL OPERATOR

7 years' experience on cutting slopes, gradings and highway construction, not afraid of work. Would like a position on any type of small machine anywhere in the U.S.A. Can do his own repair work and furnish good references. Box 6500.

Trade Notes

On June 26, Atlas Powder Company announced the consolidation of Atlas Powder Company and its totally owned subsidiary, The Giant Powder Company, Con. All Giant business will now be conducted under the name of "Atlas Powder Company — Giant Division". Giant brands of explosives will continue to be manufactured at the Giant, California, plants. Giant personnel, sales policies and office locations remain unchanged according to the announcement.

Caterpillar Tractor Company started five new "Caterpillar" Diesel Tandem Auto Patrols from Peoria July 9th on a cross-country tour. One will cover the middle-western states—one the southeastern states—one the northeastern states—one the southwestern states and the last goes to the northwest and far west coast. Not a single state in the forty-eight will be missed.

Each machine is scheduled to give over forty demonstrations with low cost Diesel fuel before hundreds of thousands of highway men and taxpayers and each one will travel more than 6000 miles.

Beginning July 23, and repeated once a month, except August, **a special five-day course in welding engineering** is being offered in Cleveland by the John Huntington Polytechnic Institute in cooperation with The Lincoln Electric Company. This course will provide engineers, welding supervisors and foremen an opportunity for intensive study of the practical and theoretical sides of welding.

Day sessions will be held between 10:30 A. M. and 4:30 P. M. at the plant of The Lincoln Electric Company which has offered the facilities of its welding school under the direction of Arthur Madson and Dean Newton. Evenings between 7:30 and 9:30 will be devoted to lectures and discussions at the John Huntington Polytechnic Institute.

Complete information on the five day course may be obtained from E. W. P. Smith, Welding Engineering Department, John Huntington Polytechnic Institute, Cleveland, Ohio.

The Chain Belt Company of Milwaukee, Wisconsin announces the appointment of the **Jenison Machinery Company**, 20th & Tennessee Streets, San Francisco, California, as a distributor of Rex construction equipment in the northern portion of the State of California.

The Jenison Machinery Company has been in the construction equipment business for many years. E. S. Jenison, President; T. F. Pimper, Vice-President; H. L. Davis, Secretary and H. J. Schiefer, Treasurer, are all prominent figures in the construction world on the West Coast. A stock of Rex mixers and pumps is carried in their warehouse making it possible for them to make delivery in the northern portion of California quite promptly.

Bucyrus-Erie Company of South Milwaukee, Wisconsin announces the appointment of **Crook Company**, of Los Angeles as dealer for the sale of small shovels, draglines, cranes, clamshells and skimmer scoops in Southern California. Crook Company is located at 2900 Santa Fe Ave., or can be reached by calling Kimball 5137.

FOR SALE

RATES:	First insertion rate per column inch	Repeat insertions (no change in copy) rate per column inch
Up to 3 inches	$4.50	$4.00
Over 3 and up to 7 inches	4.25	3.75
Over 7 inches	4.00	3.50

Rates are net (no commissions, no discounts) and payable in advance of publication. Send your remittance with insertion order and copy.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards

ONE 18-B BUCYRUS-ERIE, ⅞-yard dipper on full revolving caterpillars. Box 182-SS.

BUCYRUS ERIE So. Milwaukee, Wis.

OFFERS FOR SALE OR RENT

FACTORY REBUILT and USED SHOVELS--CRANES--DRAGLINES

Please send me full details on:

- ☐ Bucyrus-Erie Model 32-B Chain Crowd Shovel—Rebuilt—Guaranteed.
- ☐ Thew Model 35, ½ yd. Sh. Crane, S. Scoop & Trench Digger.
- ☐ General ½ yard Gas Shovel. A-1 condition. Bargain.
- ☐ Mead - Morrison Gasoline Combination Shovel-Clamshell. Good condition.
- ☐ P&H Model 207—40' Boom Dragline. Reconditioned.
- ☐ Monighan Dragline 60-foot boom. Priced right.

Name .....

Address .....

BUCYRUS-ERIE B-2 HIGH LIFT STEAM SHOVEL—21'3" boom, 16' dipper handle, ⅞ yard dipper, power boom hoist, single shaft cat. Machine in excellent condition. Located Lapeer, Michigan. Will consider any reasonable offer. Box 524-SS.

MARION MODEL 32, shop No. 5459, mounted on "cats," steam-powered, 1¼-cubic-yard dipper, 24-foot boom, 17-foot 6-inch dipper handles. Box 82-SS.

BUCYRUS-ERIE GAS-AIR TYPE GA-2 HIGH LIFT SHOVEL — 22'6" boom — 16' dipper handle—1¼ yard cast front inserted tooth dipper—single shaft caterpillar mounting—electric starter. Excellent condition. Field reconditioned. Waukesha 4-cylinder 6¼"x8" engine—New cylinder blocks and piston rings. Located near Scranton, Pennsylvania. Will demonstrate. Box 508-SS.

Marion Type 32 Steam Shovel, Shop No. 5676, 18' boom, 15' dipper handle, 1¼-cu. yd. dipper shipped May, 1926, good operating condition. Box 451-SS.

SPEEDER—½ Cu. Yd. Gasoline Shovel. Model B-2—Good Condition—Located near Detroit. Price low. Box 487-SS.

Type "B" Shop No. 1594, Caterpillar mounted, equipped with 19'6" boom, 16' dipper stick and ¾ yard dipper, in good working order. Located near Hudson, Pennsylvania. Price $1750.00. Box 493-SS.

20-B BUCYRUS-ERIE STEAM SHOVEL, serial number 4000; caterpillar mounted; 18-foot boom, 12-foot 6-inch dipper handle, 1-yard dipper; shipped new in 1923; located western Missouri. Bargain. Box 241-SS.

OSGOOD MODEL 18 Steam—¾ yard shovel—Cat mounted. Just completely overhauled. Excellent condition. Located near Indianapolis, Ind. Box 522-SS.

BUCYRUS-ERIE GA-2 Gas-Air—Extra high lift 24' boom—18' 4" dipper handle, 1 cu. yd. dipper. Single shaft cat mounting—air starter. Good condition. Located near Hartford, Conn. Box 523-SS.

BUCYRUS-ERIE—MODEL 1025—⅝ yd. Gasoline Shovel. Good condition. Located in California. Box 479-SS.

BRAND NEW PAGE DRAG SHOVEL EQUIPMENT suitable for application to Bucyrus-Erie 1030, 1035, or 32-B machines now in the field, consisting of 17-foot 1½-inch boom, 11-foot dipper handle, and two ⅝ cubic-yard dippers; one 38-inches wide over cutters—the other 49½-inches wide over cutters, together with auxiliary A frame and ropes. Priced below cost. Box 381-SS.

FOR SALE:

BUCYRUS-ERIE "GA-2" Gas-Air Shovel, Shop No. 4441. Motor overhauled. New one cubic yard dipper installed. Excellent condition. Now working. Can be inspected on job. Also Locomotive Gas Crane. Shipping point — Rochester, Pa. Address: R. H. McKinley Co., Lincoln Hotel, Rochester, Pa.

BUCYRUS-ERIE FIELD RECONDITIONED D-2 Diesel High Lift Shovel—26' Boom, 17' Dipper Handle, 1 cubic yard Dipper, Atlas four cylinder 6½"x8½" Engine. Excellent condition. Box 428-SS.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer

South Milwaukee, Wis.

KOEHRING MODEL 501—24' Boom, 16' Dipper Handle, 1¼ cu. yd. Dipper, Cable Crowd Shovel. 4 cylinder Wisconsin Gasoline Engine. Electric Starter—Automatic Trip—Chain Drive Caterpillar. Can be inspected in operation. Excellent condition. Located northern New Jersey. Box 505-SS.

Small Shovels
Under 2 Yards
Continued

BYERS BEAR CAT—⅝ yd. Gasoline Shovel—Recently overhauled — Located Birmingham, Alabama. Box 480-SS.

P & H MODEL 600—1 yd.—Gasoline Shovel—Waukesha Engine. Recently overhauled. Located in Alabama. Box 483-SS.

BUCYRUS-ERIE—TYPE B-2—Combination 40' Boom—Clamshell machine and Blaw-Knox Bucket and Extra High Lift Steam Shovel equipment — Good condition — Located near Pittsburgh, Pa. Box 484-SS.

2 BUCYRUS-ERIE—GA-2—Combination—45' Boom Clamshell—Crane machine and Extra High Lift Shovel equipment. Cat mounted—Self starter—All field rebuilt last year—Excellent condition—Located Eastern Pa. Box 485-SS.

Drag Shovel

Thew—Universal—Model 35—½-cu. yd. drag shovel complete. Center drive cat. Electric starter. 4 cylinder Waukesha 4½" x 6¼" gasoline engine. Also complete ½-yd. shovel equipment and 25' boom clamshell—crane equipment and bucket together with home-made trailer. Box 468-SS.

BUCYRUS-ERIE TYPE B ¾ yard steam shovel —spur gear cat—New boom and dipper handle. Located eastern Pennsylvania. Good operating condition. No. 519-SS.

2 BUCYRUS-ERIE B-2 Steam ⅞ yard High Lift Shovels—Cat mounted. Good operating condition. Located near Boston. Make offer. Box 521-SS.

BUCYRUS-ERIE STEAM COMBINATION ¾ yard shovel and 36' boom clamshell—Spur gear cat. Located near St. Louis. Box 520-SS.

GENERAL—½ CU. YD. Dipper, 13' Dipper handle, 16' Boom—Buda 4-cyl. 4½"x6" Gasoline Engine—Electric Starter. Only handled about 75,000 cu. yd. material, A-1 operating condition. Located near Chicago. Box 526-SS.

MEAD-MORRISON COMBINATION SHOVEL-CLAMSHELL—½ cu. yd. Dipper, 17' Dipper Handle, 18' Boom—32' Boom Clamshell Equipment and ½ cu. yd. Erie Clamshell Bucket, Wisconsin 4-cyl. 5"x6" Gasoline Engine. Good operating condition. Located near Buffalo, New York. Box No. 527-SS.

P&H MODEL 208—45' Boom Dragline—100 HP Waukesha Gas High Altitude Engine. Good operating condition. Box 432-SS.

P&H MODEL 207—40' Boom Dragline—Buda Gas Engine. Field reconditioned. Box 433-SS.

KOEHRING MODEL 1 Gas 30' Boom Crane—4½"x5" Wisconsin Engine. Box 435-SS.

BAY CITY MODEL K GASOLINE SHOVEL—17' boom, 11' Dipper Handle, ½ cubic yard Dipper, 50 HP Hercules Gasoline Engine. Machine rebuilt in 1932 and equipped with positive "Snap In" type propelling clutches and other features of Model K-2 type. Located central New York. Priced for quick sale. Box 513-SS.

BUCYRUS-ERIE LATE MODEL B-2 STEAM HIGH LIFT SHOVEL. 1 yard dipper—single shaft cat mounting. Good condition. Located near St. Louis. Box 518-SS.

BUCYRUS-ERIE TYPE B STEAM COMBINATION SHOVEL-CLAMSHELL AND STEAM HOE. Machine completely rebuilt 1929. Good operating condition. Located near Boston. Box 517-SS.

NORTHWEST MODEL 6—1½-YARD SHOVEL, Twin City 4-cylinder 7¼"x9" engine. Close Crowd. New 1931. Located near Philadelphia. Box No. 503-SS.

BUCYRUS D-2 DIESEL SHOVEL No. 4986 26' Boom, 15' dipper handle, 1-cu. yd. dipper. Priced reasonable. Located Northern Texas. Box 525-SS.

BUCYRUS-ERIE MODEL 1025 GASOLINE COMBINATION ⅝-YARD SHOVEL — 35' Clamshell, including ⅝-yard Williams Clamshell Bucket. Located near Oshkosh, Wisconsin. Good condition. Box No. 504-SS.

BUCYRUS-ERIE FIELD rebuilt, 1¾ cu. yd. gasoline shovel. Electric starter, Wisconsin 6 cylinder engine. Kohler light plant, 40' dragline equipment and bucket and clamshell equipment available. Box 467-SS.

HEAVY DUTY OSGOOD SHOVEL, Shop No. between 1600 and 1700, located near Scranton, Pa., equipped with a 1½ cubic yard dipper, in good operating condition. Price $3000.00. Boiler inspected January 1st, 1934. Box 473-SS.

BUCYRUS-ERIE 43-B GASOLINE CHAIN CROWD SHOVEL — 23' boom — 17' dipper handle—1½ cubic yard Vanderhoef dipper and teeth—electric starter—standard single shaft cat. Operated less than six months. Excellent appearance and condition. Will be demonstrated by owner. Located vicinity New York. No. 512-SS.

BUCYRUS-ERIE 37-B Gas, Chain Crowd Shovel —23' boom, 17' dipper handle, 1¼ cubic yard inserted tooth dipper, electric starter, standard single shaft cat mounting. Now at factory undergoing extensive repairs. Excellent mechanical condition. No. 511-SS.

BUCYRUS-ERIE 1030 GAS, ROPE CROWD SHOVEL. Good operating condition. Located eastern Minnesota. Available for demonstration. Price right for quick sale. Box No. 490-SS.

BUCYRUS-ERIE MODEL 1035—⅞ yard, Chain Crowd Shovel. Waukesha Model HL Engine. Electric Starter. 26" Cat. Treads. Factory rebuilt—New machine guarantee. Brand New Clamshell and Dragline equipment available. Box No. 491-SS.

BUCYRUS-ERIE MODEL 37-B—1½ cubic yard Chain Crowd Shovel. Electric Starter. Wisconsin 6-cylinder Gasoline Engine. Factory rebuilt—New machine guarantee. Box No. 492-SS.

Small Draglines
Under 2 Yards

BUCYRUS-ERIE D-2—Atlas Diesel—45' boom dragline and 1 cu. yd. Page bucket. Cat mounted. Good operating condition. Located near Marianna, Ark. Very attractive price. Box 450-SD.

BUCYRUS-ERIE D-2 DIESEL—40' Boom Dragline, used on light work about 6 months since rebuilding. Excellent condition. Located Central Ohio. Box 443-SD.

BUCYRUS-ERIE — REBUILT 45-B Gas — 65' Boom Dragline. LeRoi six cylinder 6½"x7" Gasoline Engine. 1½ KW Kohler Light Plant installed. New Machine Guarantee. Box 456-SD

BUCYRUS-ERIE FIELD rebuilt, 40' boom dragline. 1½-yd. capacity. Electric starter. Wisconsin 6 cylinder gasoline engine. Kohler light plant. Shovel equipment and clamshell equipment available. Box 467-SD.

P & H MODEL 700 DRAGLINE; number 2894, equipped with a 50 foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with 4-cylinder Atlas Diesel engine. Box 189-SD.

P & H DRAGLINE MODEL 700; number 2456 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with a Waukesha gasoline engine. Box 190-SD.

MONIGHAN 60 FOOT BOOM DRAGLINE mounted on 1-W walking device—Waukesha 5¾x8, 4 cyl. gas engine, also 1¼ yd. Page bucket. Good operating condition. Box 408-SD.

P & H Model 206 B Dragline. Good operating condition. Very favorably priced. Box 390-SD.

P&H MODEL 775—70' BOOM DRAGLINE including 1½ and 2 yard Omaha Buckets. Extra long Crawler. Excellent mechanical condition. No repairs needed. Located near Memphis. Box No. 489-SD.

2 NORTHWEST MODEL 104 Gasoline 40' Boom Draglines. Box 515-SD.

P&H MODEL 208—45' BOOM DRAGLINE—7¾"x9" four cylinder Twin City Gas Engine, 1¼ cu. yd. Omaha Bucket included. Box 460-SD.

NORTHWEST—MODEL No. 4—50' boom dragline including drop ball for rock breaking. Cat mounted. 4 cylinder 6 x 7 Wisconsin gasoline engine. Excellent operating condition. Located vicinity New York. Box 470-SD.

MONIGHAN BRAND NEW—40' Boom Dragline. Cat Mounted, Waukesha four-cylinder 6½"x7" Gasoline Engine, 900 R.P.M., 93 H.P. Electric Starter, Steel Cab. Exceptional Value. Box 453 SD.

BUCYRUS-ERIE—45' BOOM—DRAGLINE AND 2 YD. OMAHA BUCKET. LeRoi six-cylinder 6½"x7" gasoline engine. 1½ KW Kohler Electric light plant installed. Factory rebuilt. New machine guarantee. Box 476-SD.

BUCYRUS-ERIE 30-B Diesel—40' Boom Dragline. Box 437SD.

Small Clamshells and Cranes
Under 2 Yards

NORTHWEST MODEL 105 Gasoline—40' boom clamshell. Good operating condition. Located Iowa. Box 516-SCC.

BAY CITY "PUP" CLAMSHELL MACHINE. Good operating condition. Box 514-SCC.

4—BUCYRUS-ERIE—TYPE B—40' Boom—Clamshell machines—Cat mounted—Good condition. Located vicinity of Chicago. Box 481-SCC.

McMYLER MODEL J. LOCOMOTIVE CRANE—35 Ton Steam. 50 and 75-ft. Boom. 2-yd. bucket. New boiler and swinging engine recently installed. A real crane for long reach and heavy work. Thoroughly overhauled condition. $4,800.

Box 346-SCC.

BYERS BEARCAT 25' BOOM CLAMSHELL. (¾ swing) and ½ cu. yd. Clamshell Bucket, including Trench digging attachment carrying ½ cu. yd. dipper. 24" wide over cutters—will dig maximum 15'. Good operating condition. Very attractively priced. Located vicinity of Wilkes Barre, Pennsylvania. Box 494-SCC.

CRANE—THEW—UNIVERSAL—MODEL 35 — 25' boom clamshell—crane including ½ cu. yd. Williams clamshell bucket—center drive cat. Electric starter, 4 cylinder Waukesha 4½"x6¼" gasoline engine. Also, complete ½ yd. shovel equipment, drag shovel equipment and skimmer scoop equipment together with home-made trailer. Box 468-SCC.

NORTHWEST — MODEL 105 — 45' BOOM CRANE. Cat mounted. 1 yd. capacity. 6¼x8 Twin City gasoline engine. Good operating condition. Located vicinity New York. Box 469-SCC.

BUCYRUS-ERIE FIELD rebuilt, 40' boom clamshell machine. 1½ yd. capacity. Electric starter. 6 cylinder Wisconsin gasoline engine. Kohler light plant. Shovel equipment and dragline equipment with bucket also available. Box 467-SCC.

THEW-UNIVERSAL 35 CRANE on center drive cats, 36' Boom, fairleads, ½ yd. dragline bucket, 3000 lb. hammer, leads and cap. Excellent condition, sale or rent. Located Western Ohio. Box 457-SCC.

Large Shovels and Draglines
2 Yards and Over

FOR SALE

CLASS 14 STEAM DRAGLINE with 2-yard Page bucket. Location Iowa. Very good condition. Surprisingly low price f.o.b. cars.

ALSO

2-YARD MONIGHAN STEAM DRAGLINE in fair condition—cheap. Box 419-LSD.

70-TON STEAM SHOVEL mounted on "cats," caterpillars in good condition. Located near Hazelton, Pa. Box 162-LSD.